

ADDITIONAL NOTES ON THE GENUS VERBENA. XXV

Harold N. Moldenke

VERBENA HALEI Small

Additional synonymy: Verbena halii Small ex Moldenke, *Phytologia* 36: 47, in syn. 1977.

Additional & emended bibliography: Loes., *Verh. Bot. Ver. Brand.* 53: 74. 1912; G. W. Thomas, *Tex. Pl. Ecolog. Summ.* 78. 1969; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.*, imp. 1, 717 (1969) and imp. 2, 717. 1974; [Bard], *Bull. Torrey Bot. Club* 102: 431. 1975; E. H. Jordan, *Checklist Organ Pipe Cact. Natl. Mon.* 7. 1975; Moldenke, *Phytologia* 30: 142—143 & 159 (1975) and 31: 375, 377, & 378. 1975; Perkins, Estes, & Thorp, *Bull. Torrey Bot. Club* 102: 194—198. 1975; Anon., *Biol. Abstr.* 61: AC1.732. 1976; Hurd & Lindl., *Smithson. Contrib. Zool.* 220: 10. 1976; Ziegler & Sohmer, *Contrib. Herb. Univ. Wisc. LaCrosse* 13: 16. 1976; Moldenke, *Phytologia* 34: 20, 250, 251, 270, & 279 (1976) and 36: 47, 128, 134, 135, 143, 152, & 157. 1977; A. L. Moldenke, *Phytologia* 36: 87. 1977.

Lewis and his associates encountered this plant along a stream-side in Coahuila. Demaree reports it as "common" on low ridges, at 670 feet altitude, in Texas. The Ellisons assert that it was "abundant in local population in full sun in sandy soil with V. brasiliensis, no hybridization evident", the corolla "bluish-lavender".

Other recent collectors refer to this plant as an upright perennial herb, 2 feet tall, and have encountered it in old rice fields, in sandy soil along roadsides, in open dry gravelly soils on railroad embankments, in "nearly level stiff or buckshot soils", on the river side of levees, in sandy dry open areas, and in "nearly level to gently sloping front lands", at 375 meters altitude. Brown refers to it as common on road shoulders in marshes; Allen found it abundant in open areas with V. tenuisecta and Cynodon; Montz reports it infrequent on levee spillways with Ambrosia; and Bougere found it "not abundant, in small compact patches on roadsides". Ajour found it "abundant in very dry soil in shade with a lot of sedges and grasses".

The corollas are said to have been "deep-blue" on Ajour 11, "lavender" on Bougere 1087, Correll & Johnston 22127, and Luke s.n., "blue" on Allen 675 & 990, and Correll & Correll 12421, "purple" on Curry, Martin, & Allen 437, and "purple to lavender" on Killmer 35. Wendt and his associates found it growing "in saline and probably gypsiferous fine alluvial soil in matorral desértico inerme y con espinos laterales with fine mineralized alluvial soil in bajada", growing with Prosopis glandulosa, Koeberlinia spinosa, Condalia, Lycium, and Selinocarpus. Eger reports it common "in full sun in sandy soil of pine woods with Oxalis, Aster, and Lobelia". Higgins found it among "mixed grassland

shrubs with mesquite and oak predominating".

Brown & McFarlin note that there are "no appendages on the anthers". Mrs. Jordan (1975) calls the species "Hale's vervain". Perkins and his associates (1975) inform us that V. halei is highly autogamous (like V. urticifolia), the number, frequency, and pollen-carrying ability of insect vectors favor crosses of V. stricta Vent. with V. urticifolia L. and V. halei. They found that 12 plants of V. halei which were insect-visited and with 462 potential seeds had a 68 percent seed-set, while 15 bagged plants with only 391 potential seeds had a 54.5 percent seed-set. They found that the anthers and stigmas in V. halei are less than 1 mm. apart and the corolla-tube is straight, the plants are short (25--70 cm. tall) with an inflorescence of 10--58 branches (mean 26.4), each with only 2 flowers about 3.4 mm. apart at anthesis, and observed the following insects visiting the flowers: Diptera: Allograpta sp., Baccha sp. (with Verbena pollen on head), Systropus sp. (with pollen on head), and Villa sp.; Hymenoptera: Calliopsis andreniformis, Ceratina sp. (with pollen on head), Augochlorella striata, and Megachile sp. (with pollen on head); and Lepidoptera: Hemiargus isola, Phycoides phaon (with pollen on head), and Strymon melinus.

Loesener (1912) cites Seler 3460 as "V. officinalis L. forma?" from Atascosa County, Texas. The C. M. Allen 1179, distributed as V. halei, is the type collection of xV. allenii Moldenke, while Ellis, LeDoux, & Watkins 964 is V. canescens H.B.K.

Additional citations: SOUTH CAROLINA: Aiken Co.: Ellison & Ellison 1010 (Sd--77488). GEORGIA: Sumter Co.: Moldenke & Moldenke 29341 (Ld). FLORIDA: Levy Co.: Moldenke & Moldenke 29444 (Ld). LOUISIANA: Acadia Par.: D. E. Ellis 58 (Lv). Allen Par.: Eger 141 (Ld). Bossier Par.: Robinette 147 (Lv), 203 (Lv). Calcasieu Par.: J. A. Churchill s.n. [2 May 1955] (Ln--204089); Wurzlow s.n. [Sept. 15, 1917] (Lv). Cameron Par.: C. A. Brown 9271 (Lv). East Baton Rouge Par.: C. A. Brown 1156 (Lv), s.n. [April 20, 1935] (Lv); Brown & McFarlin 2118 (M1); N. F. Petersen s.n. [May 7, 1909] (Lv, Lv). Jefferson Davis Par.: D. Dickinson s.n. [June 8, 1918] (Lv). Lafayette Par.: Claycomb s.n. [April 15, 1943] (Lv). Lincoln Par.: Thomas & Gremillion 2487 (Kl--10265). Ouachita Par.: Pickett & Bot. Class 50 (Lo). Plaquemines Par.: V. Keller s.n. [Aug. 24, 1917] (Lv, Lv). Pointe Coupee Par.: M. Chaney 399 (Lv). Saint Charles Par.: Montz 3089 (Lv). Saint Helena Par.: C. M. Allen 675 (Lv), 990 (Lv). Saint Mary Par.: Bynum, Ingram, & Jaynes s.n. [Apr. 18, 1933] (Lv). Saint Tammany Par.: Arsene 12242 (Lv); Bougere 1087 (Lv), 1096 (Lv). Tangipahoa Par.: Correll & Correll 9254 (Lv). Terrebonne Par.: Wurzlow s.n. [May 1, 1912] (Lv). Vermilion Par.: C. A. Brown 18279 (Lv), 21409 (Lv); Killmer 35 (Lv). Vernon Par.: Turba s.n. [April 22, 1935] (Lv). West Feliciana Par.: Curry, Martin, & Allen 437 (Lv). TEXAS: Austin Co.: Wurzlow

s.n. [1905] (Lv). Bowie Co.: Correll & Correll 12421 (M1). Brazos Co.: Ajour 11 (N). Cameron Co.: R. Runyon 4857 (Mu). Comal Co.: Charette 814 (Mu); Lindheimer 1076 (Mu—4089). Galveston Co.: Lindheimer s.n. [Galveston, May 1843] (Mu—354). Harris Co.: Luke s.n. [2 April 1972] (Lv). Orange Co.: J. A. Churchill s.n. [1 May 1955] (Ln—204154). San Patricio Co.: R. Runyon 4720 (Mu). Tarrant Co.: Demaree 68284 (Ld). Wichita Co.: L. C. Higgins 10022 (N). Young Co.: Correll & Johnston 22127 (N). MEXICO: Coahuila: Lewis, Lehto, Keil, Meyer, LeBounty, & Pinkava 5876 (Te—68563); Wendt, Chiang C., & Johnston 10147 (Ld). CULTIVATED: Missouri: Prince Paul of Wurttemberg s.n. [Hort. Mergentheim] (Mu—1573).

VERBENA HALEI f. PARVIFLORA Moldenke, *Phytologia* 34: 20. 1976.

Bibliography: Moldenke, *Phytologia* 34: 20 & 251. 1976.

Citations: TEXAS: Galveston Island: Johnston, Johnston, Sautrup, Darr, & Darr 12436a (Ac—isotype, Z—type).

VERBENA HALEI f. ROSEIFLORA (Benke) Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 213 & 362. 1974.

VERBENA HASSLERANA Briq.

Additional bibliography: Moldenke, *Phytologia* 30: 143. 1975.

Pedersen comments that this species is found in moist meadows, on the banks of small streams, and elsewhere in Corrientes. He found it in flower and fruit in January, and the corollas on Pedersen 988 are described as having been "lilac" in color when fresh.

Additional citations: ARGENTINA: Corrientes: Pedersen 988 (N).

VERBENA HASSLERANA var. GLANDULOSA Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 351 & 464. 1974.

VERBENA HASTATA L.

Additional synonymy: Verbena pinnatifida Ph. ex G. Don in Loud., Hort. Brit., ed. 1, 247. 1830. Verbena laciniosa Schwaegr. ex Moldenke, *Phytologia* 34: 279, in syn. 1976. Verbena paniculata L. ex Moldenke, *Phytologia* 34: 279, in syn. 1976. Verbena hastata var. paniculata Lam. ex Moldenke, *Phytologia* 34: 279, in syn. 1976.

Additional & emended bibliography: G. Don in Loud., Hort. Brit., ed. 1, 246 & 247 (1830) and ed. 2, 246 & 247. 1832; Loud., Hort. Brit., ed. 2, 552. 1832; G. Don in Loud., Hort. Brit., ed. 3, 246 & 247. 1839; Buek, Gen. Spec. Syn. Candol. 3: 495. 1858; Paine, Ann. Rep. Univ. N. Y. 18: [Pl. Oneida Co.] 109. 1865; Kuntze, Rev. Gen. Pl. 2: 510. 1891; Conard, Pl. Iowa 44. 1951; R. A. Davidson, State Univ. Iowa Stud. Nat. Hist. 20 (2): 77. 1959; Hall & Thompson, Cranbrook Inst. Sci. Bull. 39: 74. 1959; Cooper-

rider, State Univ. Iowa Stud. Nat. Hist. 20 (5): 70. 1962; P. W. Thompson, Cranbrook Inst. Sci. Bull. 52: 37. 1967; Barker, Univ. Kans. Sci. Bull. 48: 571. 1969; G. W. Thomas, Tex. Pl. Ecolog. Summ. 78. 1969; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717. 1969; Rimpler, Lloydia 33: 491. 1970; Scully, Treas. Am. Ind. Herbs 283. 1970; Anon., Bioresarch Ind. 7: 1061. 1971; Ellison, Kingsbury, & Hyypio, Comm. Wild Fls. N. Y. [Cornell Ext. Bull. 990:] 19. 1973; Hathaway & Ramsey, Castanea 38: 77. 1973; A. & C. Krochmal, Guide Medic. Pl. U. S. 229--230, 246, 257, & 258, fig. 259. 1973; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 2, 717. 1974; El-Gazzar, Egypt. Journ. Bot. 17: 75 & 78. 1974; R. D. Gibbs, Chemotax. Flow. Pl. 3: 1753--1755 (1974) and 4: 2295. 1974; Mrs. P. Martin, Am. Horticulturist 53 (5): 33. 1974; Rousseau, Géogr. Florist. Qué. [Trav. Doc. Cent. Étud. Nord 7:] 376, 473, 502, 550, 643, & 788, map 826. 1974; Stark, Am. Horticulturist 53 (5): 11. 1974; Welsh, Utah Pl., ed. 3, 354 & 473. 1974; Whitney in Foley, Herbs Use & Delight [198]. 1974; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S., imp. 2, 2: 1396, [1398], 1399, & 1775, fig. 654 g--k. 1975; Kociman, Act. Bot. Neerl. 24: 464. 1975; Moldenke, Phytologia 30: 143-148 & 174 (1975) and 31: 374, 376--378, & 409. 1975; A. L. Moldenke, Phytologia 31: 415. 1975; United Communications (Woodmere, N. Y.), Herbal Visual & Study Chart n.p. 1975; H. D. Wils., Vasc. Pl. Holmes Co. Cat. 54. 1975; Grisé, Bot. Black Amer. 191. 1976; Lacoursière, Pontbriand, & Dumas, Naturl. Canad. 103: 174. 1976; Moldenke, Phytologia 34: 247--251, 270, & 279. 1976; Van Bruggen, Vasc. Pl. S. Dak. 369 & 536. 1976; [Voss], Mich. Bot. 15: 237. 1976; Moldenke, Phytologia 36: 28, 29, 47, & 126. 1977; F. H. Montgomery, Seeds & Fruits 201, fig. 6, & 230. 1977; Taylor & Mac Bryde, Vasc. Pl. Brit. Col. 436 & 751. 1977.

Additional illustrations: Ellison, Kingsbury, & Hyypio, Comm. Wild Fls. N. Y. [Cornell Ext. Bull. 990:] 19. 1973; A. & C. Krochmal, Guide Medic. Pl. U. S. 230, fig. 259. 1973; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S., imp. 2, 2: [1398], fig. 654 g--k. 1975; F. H. Montgomery, Seeds & Fruits 201, fig. 6. 1977.

Montgomery (1977) describes the seeds of this species as "Nutslets 2.0 x 0.6 x 0.5 mm, similar to the previous species [V. bracteata], margins ridged, dorsal surface longitudinally 3--5-ribbed on the lower half and reticulate near the apex, inner faces papillose".

Wilson (1975) reports V. hastata frequent on streambanks and in low pastures and marshes in Holmes County, Ohio. Other recent collectors have found it on the shingle shores of lakes, in muck soil along drainage ditches, on prairies, by lakes with peat bogs along the shores, in meadows and ditches, on floodplains and open pond banks, in marshy land, and on gravel bars and rocky ground along creeks.

The corolla is said to have been "deep-purple" on W. D. Stevens 1633 and this collection also exhibits perfectly hastate leaves. On Correll & Correll 30034 the corolla was "lavender" and on Blake

11178 it was "violet-purple".

Hathaway & Ramsey (1973) record V. hastata from Pittsylvania County, Virginia. Churchill & Sutherland encountered it "in marshy banks of small pond depressions in cultivated fields with Salix, Cormus, Scirpus, and Asclepias in Otoe County, Nebraska. Thompson (1967) records it from Leelenau County, Michigan, noting that it grows there "along roadsides and in meadows. Common"; Hall & Thompson (1959) found it in Oakland County in the same state. Cooperrider (1962) reports it "frequent....Marshy places; stream banks; wet ditches" in Clinton and Jones Counties, Iowa. Davidson (1959) says that it is common "Usually in wet to moist open places, occasionally in upland woods and openings....Plants of dry soil, not recognizable as hybrids, differ considerably from those found in moist situations, those from the dry places being smaller with less incised leaves and more sparingly branched inflorescences." This is a very valid comment and I have frequently observed these differences, too, among others, in the field. I think that the dryland plants showing these characters deserve a form name.

Barker (1969) refers to V. hastata as "Occasional, along prairie drainage areas, in low prairie canyons, along margins of impoundments and streams. Occurs throughout the area [Kansas]." Stark (1974) asserts that it is usually found in "rich soils with high humus levels" and a pH level of 6.0, while Martin (1974) recommends it for "most open garden in sun with pH of 5-6.5". Taylor & MacBryde (1977) classify the corolla-color as "blue and violet" and gives its normal blooming period as June to September in British Columbia, where it is certainly var. scabra to which they are referring.

Don (1830) calls V. paniculata the "panicled vervain" and says that it was introduced into English gardens from "N. Amer." in 1800; he calls V. hastata, which he keeps as a separate species, the "halberd-leaved vervain" and gives its date of introduction from "Canada" as 1710, while he says that what he calls V. pinnatifida, the "pinnatifid vervain", came from "N. Amer." in 1810. Curiously, he places V. paniculata in his section Indivisae and the other two in section Trifidae.

Verbena laciniosa is based on an unnumbered collection from the Schwaegrichen herbarium now deposited in the herbarium of the Staatssammlung at Munich. The plant was originally cultivated in the Leipzig botanical garden and exhibits remarkably laciniate-lobed leaves. Probably it is deserving of form rank. It should also be noted here that very plainly hastate leaves are seen on the Herb. Schreber s.n. [Hort. Erl. 1770] & s.n. [Insul. Bahamensis] specimens cited below, clearly showing why Linnaeus applied the epithet "hastata" to this species and also showing Farwell's reason for separating the commonly found form of the species as var. paniculata. Personally, I feel that form rank would be more justified.

Rimpler (1970) reports the isolation of a new iridoid, hastatocide, from V. hastata. Gibbs (1974) reports that cyanogenesis

is absent in the shoots of this species, leucoanthocyanin is absent from the leaves, and syringin is absent from the stems, while the Ehrlich test gives negative results in the leaves and the Juglone test is negative in the stems and leaves but produces a blue fluorescence.

Scully (1970) reports that the Amerinds of North America used "vervain" in the treatment of colds and quite commonly against dropsy, with or without milkweed and decocted cottonwood leaves. Against jaundice they used it as a decoction alone or with any of the following where available: cinquefoil, parsley, oregon-grape, nettle-root, or columbine. Mixed with fat, it was used in treating swelling or hardening of the testicles, especially if accompanied by pain. As an infusion for quieting the nerves, a sponge bath and tea of verbena leaves is still used today among some tribes; for scurvy an infusion alone or mixed with wormwood or birch leaves is used. It is drunk as a tea in cases of smallpox to mitigate the suffering; as a tea also for sore throat and intestinal worms, especially in children. But Scully points out that in almost all cases vervain was not the first choice of possible medications. It is probable that several species of the genus are involved here.

Material of V. hastata has been misidentified and distributed in various herbaria as "V. hasta L." On the other hand, the Bresinsky s.n. [Lafayette, 12.7.1967], Correll & Correll 3984h, Gilkey s.n. [July 31, 1945], Higgins 9712, MacDougal 566, A. R. Moldenke 1297, E. L. Reed 403h, Tharp 450h, Woodcox 55, and York & Rodgers 363, distributed as typical V. hastata, actually represent var. scabra Moldenke, Herb. Zuccarini s.n. [Hort. bot. Monac.] is a mixture of xV. baileyana Moldenke and V. officinalis L.; Chandrapanya 2 and Kirby 160 are V. brasiliensis Vell.; C. A. Brown s.n. [Sept. 30, 1936] is V. canadensis (L.) Britton; Engelmann s.n. [Banks of the Mississippi, July 1842] and Herb. Staatsherb. Münch. s.n. [Hort. Bot. Monac. 28.7.53] are xV. engelmannii Moldenke; Fltis, Bell, Melchert, Patman, & Witt 12361 is xV. perriana Moldenke; Hillebrand 1863 is V. robusta Greene; Meebold 19175 is V. simplex Lehm.; Herb. Kummer s.n. [Mississippi] is V. urticifolia L.; and Schroer 71 is V. xutha Lehm.

Additional citations: MAINE: York Co.: F. T. Hubbard s.n. [VIII/15/1901] (Ld). VERMONT: Grand Isle Co.: Moldenke & Moldenke 31103 (Ac, Ld). Lamoille Co.: Moldenke & Moldenke 31100 (Gz). MASSACHUSETTS: Hampshire Co.: Ahles 77872 (Mu). Norfolk Co.: Blake 11178 (Ld). NEW YORK: Monroe Co.: H. Ernst 1102 (Mu). Oswego Co.: Moldenke & Moldenke 31132 (Ld). Schuyler Co.: J. A. Churchill s.n. [23 August 1937] (Ln—213612); Moldenke & Moldenke 31135 (Tu). Yates Co.: Moldenke & Moldenke 31133 (Lv). NEW JERSEY: Morris Co.: Moldenke & Moldenke 25633 (Ld, Ld). County undetermined: Hillebrand s.n. (Mu). PENNSYLVANIA: Berks Co.: Herb. Zuccarini s.n. [Reading] (Mu—321). Bucks Co.: Mayer s.n. [Qua-

kertown, Aug. '76] (Mu). LYCOMING Co.: Moldenke & Moldenke 31149 (Mu, Ut). MONROE Co.: Swinerton s.n. [Pocono Mts., Aug. 1896] (Mu). NORTHAMPTON Co.: Herb. Schreber s.n. [Bethlehem] (Mu—316), s.n. [Nazareth] (Mu—317). TIAGA Co.: Moldenke & Moldenke 31139 (W). UNION Co.: Moldenke & Moldenke 31150 (Lv, Tu, W, Ws). County undetermined: Schweinitz s.n. (Mu—1257). ILLINOIS: Cass Co.: Geyer s.n. [Beardstown, July 1842] (Mu—324, Mu—362, Mu—1676). Cook Co.: Solereder s.n. [Chicago, Aug. 1893] (Mu—4140). OHIO: Auglaize Co.: Purpus 242 (Mu). MICHIGAN: Alger Co.: J. A. Churchill s.n. [9 July 1964] (Ln—204262). Branch Co.: W. D. Stevens 1633 (Ln—237063). Ingham Co.: R. D. Bradbury 32 (Ln—161013). Macomb Co.: J. A. Churchill s.n. [24 July 1954] (Ln—203431). Otsego Co.: Bresinsky s.n. [Hardwood Lake] (Mu). Wayne Co.: Farwell 8461 1/2 (Mu); G. Stewart s.n. [Aug. 1898] (Ln—142428, Ln—142430). WISCONSIN: LaCrosse Co.: Demaske 2220 (Ld). MINNESOTA: Hennepin Co.: Sandberg 152 [36] (Mu). KANSAS: Lyon Co.: J. L. Watson 7 (Lc). MISSOURI: Clark Co.: E. J. Palmer 43737 (Ld). Saint Louis: Eggert 7558 (Mu); Muhlenbach 1035 (Mu). County undetermined: Martens s.n. (Mu—322). NEBRASKA: Otoe Co.: Churchill & Sutherland 3945 (N). OKLAHOMA: Muskogee Co.: Wallis 7728 (Au—170667). Sequoyah Co.: Wallis 5557 (Au—169341). TEXAS: Hemphill Co.: Correll & Correll 30034 (Ld). CULTIVATED: Bahama Islands: Herb. Schreber s.n. [Insul. Bahamensis] (Mu—315). England: Herb. Grimm s.n. [H. Kew.] (Mu—314). France: Thouin s.n. [Hort. Paris.] (Mu—355, Mu—356). Germany: Herb. Schreber s.n. [Hort. Erl. 1770] (Mu—319); Herb. Schwaegrichen s.n. [Hort. Lipsiensis] (Mu—1365); Herb. Zuccarini s.n. [h. b. E.] (Mu—359), s.n. [Hort. bot. Monac.] (Mu—357, Mu—358). LOCALITY OF COLLECTION UNDETERMINED: Herb. Grimm s.n. (Mu—1255); Herb. Mus. Bot. Landismuth. s.n. (Mu—320); Herb. Reg. Monac. s.n. (Mu—313); Herb. Schreber 17 (Mu—318); Herb. Schwaegrichen s.n. (Mu—1256); Hooker s.n. [United States] (Mu—320).

VERBENA HASTATA f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 217 (1974) and 30: 176. 1975.

VERBENA HASTATA f. CAERULEA Moldenke

Additional synonymy: Verbena americana, urticae foliis angustioribus, flore coeruleo P. Herm., Hort. Acad. Lugd.-Bat. Cat. 699. 1687. Verbena americana urticae foliis angustioribus, spica multiplici flore caeruleo P. Herm., Fl. Lugd.-Bat. 54—55. 1690. Verbena urticae fol. angustiore flore coeruleo Herb. ex Rivin., Introd. Gen. Rem Herb. Ord. Pl. Irreg. Monop. [24], pl. [57]. 1690. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus caeruleis P. Herm., Parad. Bat.,

ed. 1, 242. 1698. Verbena americana urticae foliis angustioribus, flore caeruleo Moris., Pl. Hist. Univ. Oxon. 3: "408" [=418]. 1699. Verbena altissima americana, spica multiplici, urticae foliis angustis, floribus coeruleis Herm. apud Ray, Hist. Plant. 3: Suppl. 286. 1704. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus coeruleis P. Herm., Parad. Bat., ed. 2, 242. 1705. Verbena; americana; altissima; urticae foliis angustioribus; spicis brevioribus; floribus caeruleis Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186. 1720. Verbena americana altissima, urticae foliis angustioribus, spicis brevibus, floribus caeruleis Boerh. apud L., Hort. Cliff., imp. 1, 11, in syn. 1737. Verbena americana altissima, urticae foliis angustioribus, spicis brevioribus, floris caeruleis Boerh. apud A. van Toeyen, Fl. Leyd. Prod. 327, in syn. 1740. Verbena americana altissima, spica multiplici, urticae foliis angustis, floribus caeruleis Ray apud L., Hort. Ups. 8, in syn. 1748. Verbena americana altissima, spici multiplici, urticaefoliis angustis, floribus caeruleis Herm. ex L., Sp. Pl., ed. 1, imp. 1, 1: 20, in syn. 1753. Verbena americana altissima, spica multiplici, urticae foliis angustis, floribus coeruleis Ray apud J. F. Gronov., Fl. Virg., ed. 2, 4, in syn. 1762. Verbena americana, altissima, spica multiplici, urticaefoliis angustis, floribus caeruleis Herm. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. Verbena americana altiss., spica multipl., urticae fol. angustis, fl. coeruleis Herm. apud H. E. Richter, Cod. Bot. Linn. 35, in syn. 1835. Verbena amer. urticae fol. angustiorib., fl. caeruleo Moris apud H. E. Richter, Cod. Bot. Linn. 35, in syn. 1835. Verbena americana, spica multiplici, foliis urticae angustissimis, floribus caeruleis Herm. ex Moldenke, Résumé Suppl. 4: 14, in syn. 1962.

Additional bibliography: L., Hort. Cliff., imp. 1, 11 (1737) and imp. 2, 11. 1968; Moldenke, Phytologia 28: 217, 426, & 427 (1974) and 31: 409. 1975.

VERBENA HASTATA f. ROSEA Cheney

Additional bibliography: Moldenke, Phytologia 28: 352, 451, 464, & 465. 1974.

VERBENA HASTATA var. SCAEBA Moldenke

Additional bibliography: D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S., imp. 2, 2: 1396, 1399, & 1775. 1975; A. L. Moldenke, Phytologia 31: 415. 1975; Moldenke, Phytologia 30: 146—148 (1975), 31: 374 & 376—378 (1975), and 34: 248—251. 1976.

Recent collectors have encountered this plant in moist soil, moist sandy loam, and moist loam at seeping springs in open grassland, at the edge of ponds, in Populus-Proserpis-Tamarix communities, and in the drier areas of bogs (as the typical form),

but also in "badly overgrazed pastures" (as the field form) — in fact, it has been described by some as a "weed in horse pastures", a typical field form habitat.

In addition to the months previously reported, it has been found in flower in October and at 4600 feet altitude (in Utah). Crutchfield reports it attaining a height of 6 feet (like the typical form and unlike the usual "field form". Material has sometimes been misidentified and distributed in herbaria as V. stricta Vent. and as "V. hasta L."

The corollas are said to have been "purple" on Crutchfield 3525 and "deep-purple" on Crutchfield 3551 when fresh, as in the typical form.

The Spellenberg & Spellenberg 2082, distributed as V. hastata var. scabra, actually is V. macdougalii Heller.

Additional citations: INDIANA: Tippecanoe Co.: Bresinsky s.n. [Lafayette, 12.7.1967] (Mu). KANSAS: Dickinson Co.: A. R. Moldenke 1297 (Ld). UTAH: Utah Co.: Woodcox 55 (Au—122283). NEBRASKA: Pierce Co.: N. F. Petersen s.n. [Aug. 10, 1910] (Lv, Lv). OKLAHOMA: Ottawa Co.: Correll & Correll 3984h (Ld). TEXAS: Hemphill Co.: Crutchfield 3525 (Ld); E. L. Reed 4034 (Au—122282); Tharp 4504 (Au—122281). Hutchinson Co.: Crutchfield 3551 (Ld). Oldham Co.: York & Rodgers 363 (Au—201798). Potter Co.: Higgins 9712 (N). ARIZONA: Coconino Co.: MacDougal 566 (Au—122291). WASHINGTON: Yakima Co.: Moldenke & Moldenke 2123 (Ld). OREGON: Multnomah Co.: Gilkey s.n. [July 31, 1945] (Au—122290).

VERBENA HATSCHBACHI Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 352. 1974.

The corollas are said to have been "violet" in color when fresh on Hatschbach 8558.

Additional citations: BRAZIL: Paraná: Hatschbach 8558 [Herb. Brad. 15182] (Mu).

VERBENA HAYEKII Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 218 & 252. 1974; Soukup, *Biota* 11: 18. 1976.

Richardson refers to this as a scattered prostrate plant in the rocky soil of roadsides, and the corollas on Richardson 2066 are said to have been "blue".

Additional citations: PERU: Junín: Richardson 2066 (Ld).

VERBENA HERTERI Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 352. 1974.

Additional citations: URUGUAY: Herter 979 [Herb. Herter 82378] (Mu—*isotype*).

VERBENA HIRTA Spreng.

Additional bibliography: Buek, *Gen. Spec. Syn. Candoll.* 3: 495. 1858; Moldenke, *Phytologia* 28: 352 (1974), 33: 480 (1976) and 34: 259. 1976.

Recent collectors have encountered this plant in secondary forests on laterite soil, on campos, in open scrub, in ruderal grasslands, and among ruderal vegetation on hills, flowering and fruiting in May, October, and November. Araujo refers to it as a heliophilous herb "crescendo em pasto a beira do precipício". The Tryons describe it as "woody at base, 0.5 m. tall". The corollas are said to have been "lilac" on Dzięwa 3, Ferreira 97, and Kummerow 646 & 1049, "blue-purple" on Tryon & Tryon 6713, "blue-purple (5P5/8)" on Lindeman & Haas 5137, "purple" on Lindeman & Haas 300, "purple (2 1/2 P6/6)" on Lindeman & Haas 4008, "purple (2 1/2 P6/8)" on Lindeman & Haas 18, "purple (2 1/2 P7/6)" on Lindeman & Haas 2444, "purple, tube slightly paler (2 1/2 P5/8-6/4)" on Lindeman & Haas 2460, and "red" on Araujo 1262.

On Lindeman & Haas 2460 the entire plant is pronouncedly cinnamon-colored, but this is probably an effect produced by a layer of dust from its roadside habitat.

The Dusén s.n. [11.12.903] and Smith & Klein 13885, distributed as and previously cited by me as typical V. hirta, are better regarded as representing var. dusenii Moldenke, of which the former is the type collection.

Additional citations: BRAZIL: Paraná: Dzięwa 3 (Ld); L. F. Ferreira 97 (Ld); Kummerow 646 (Ac), 1049 (Ld), 1123 (Ld); Lindeman & Haas 18 (Ws), 300 (Ac), 2444 (Ut—320417), 2460 (Ut—320416), 4008 (Ld). Rio de Janeiro: Angeli 107 [Herb. FEEMA 345] (Ld); A. Castellanos s.n. [3.XII.1964; Herb. FEEMA 7165] (Ld); Dusén s.n. [Oct. 1903] (Mu—4251); Lindeman & Haas 5137 (Ut—320428); Tryon & Tryon 6713 (N). Rio Grande do Sul: Araujo 1262 [Herb. FEEMA 12280] (Pf). Santa Catarina: A. Castellanos 24675 [Herb. Cent. Pesq. Florest. 3417] (Fe). State undetermined: J. E. Pohl s.n. (Mu—571).

VERBENA HIRTA var. DUSENII Moldenke, *Phytologia* 33: 480. 1976.

Bibliography: Moldenke, *Phytologia* 33: 480 (1976) and 34: 259. 1976.

Collectors have found this plant growing on campos, on campos near the borders of planaltos, and in low woods, at 900—1000 m. altitude, flowering in November and December. Hitherto it has been confused with, and material has been distributed as, typical V. hirta Spreng.

Citations: BRAZIL: Paraná: Dusén s.n. [11.12.903] (N—type); Lindeman & Haas 3251d (Ut—320415). Santa Catarina: Smith & Klein 13885 (Ac, N).

VERBENA HIRTA var. GRACILIS Dusén

Additional bibliography: Moldenke, *Phytologia* 28: 352. 1974.

In addition to the months previously reported, this plant has been found in fruit in October. The corollas are said to have been "dark-lilac" on Hatschbach 35191.

The Reitz & Klein 17616 previously cited by me and distributed

as this variety actually is V. strigosa Cham.

Additional citations: BRAZIL: Paraná: Hatschbach 35191 (Ld).

VERBENA HISPIDA Ruiz & Pav.

Additional & emended bibliography: G. Don in Loud., Hort. Brit., ed. 1, 247 (1830) and ed. 2, 247. 1832; G. Don in Loud., Hort. Brit. Suppl. 1: 680. 1832; Loud., Hort. Brit., ed. 2, 552. 1832; Baxt. in Loud., Hort. Brit. Suppl. 2: 680. 1839; G. Don in Loud., Hort. Brit., ed. 3, 247. 1839; Baxt. in Loud., Hort. Brit. Suppl. [3]: 655. 1850; Buek, Gen. Spec. Syn. Candoll. 3: 494 & 495. 1858; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717 (1969) and imp. 2, 717. 1974; R. D. Gibbs, Chemotax. Flow. Pl. 3: 1753—1755 (1974) and 4: 2295. 1974; Kooiman, Act. Bot. Neerl. 24: 464. 1975; Moldenke, Phytologia 30: 148. 1975; Soukup, Biota 11: 18. 1976; Moldenke, Phytologia 36: 33 & 151. 1977.

Don (1830) calls this the "hispid vervain" and says that it was introduced into English gardens from Peru in 1816. The corollas are described as having been "violet" in color when fresh on Krapovickas, Schinini, & Quarín 26557. López-Palacios describes the plant as "hierba rastrera de hojas sésiles y muy pilosas, espigas cilíndricas y relativamente engrosadas".

Gibbs (1974) reports that cyanogenesis and leucoanthocyanin are absent from the leaves of this species and syringin is absent from the stems, while the Juglone test gives negative results in the leaves and bark.

The Pedersen 9867, cited below, collected in clay soil along roadsides in the Chaco, is said by Troncoso perhaps to be xV. dermeni Moldenke, but I fail to discern the hybrid characters in the specimen cited. The Pavon collection cited below may be part of the type collection. The Herb. Kummer s.n. [Hort. bot. Monac.] is a mixture with V. rigida Spreng.

The Buchtien s.n. [Valdivia, 7/11/1902], distributed as V. hispida, actually is V. bonariensis L., while W. Forster s.n. [8.I. 1954] is V. parvula Hayek.

Additional citations: ECUADOR: Loja: López-Palacios 4163 (Ld). PERU: Province undetermined: Pavon s.n. (Mu—1257). BOLIVIA: La Paz: O. Buchtien 8426 (Mu). CHILE: Valpariso: Zöllner 8100 (Gz). ARGENTINA: Chaco: Pedersen 9867 (N). Jujuy: Cabrera, Ancibor, Ré, Tello, & Torres 15080 (Mu); Krapovickas, Schinini, & Quarín 26557 (Ld). Mendoza: Semper s.n. [12-18/III/944] (Ut—330561B). CULTIVATED: Germany: Herb. Kummer s.n. [Hort. bot. Monac.] (Mu—1276); Herb. Zuccarini s.n. [Hort. bot. Monac. 1836] (Mu—326), s.n. [Hort. bot. Monac. 1837] (Mu—284), s.n. [Hort. bot. Monac.] (Mu—325).

VERBENA HOOKERIANA (Covas & Schnack) Moldenke

Additional & emended bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 494. 1858; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 715 & 717 (1969) and imp. 2, 715 & 717. 1974;

Moldenke, *Phytologia* 30: 148 (1975) and 36: 149. 1977.

The corollas on Loosen 8 are said to have been "violet" in color when fresh.

Additional citations: ARGENTINA: Córdoba: Loosen 8 (Mu—4370). Río Negro: O'Donell 1553 (Ut—330530B, Ut—33071B).

VERBENA HUMIFUSA Cham.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Moldenke, *Phytologia* 28: 353. 1974.

Reineck & Czermak 21 is a mixture with V. marrubioides Cham.

Additional & emended citations: BRAZIL: Rio Grande do Sul: Reineck & Czermak 21, in part [Herb. Osten 4160] (Mu, N, N—photo, Po—63874, Po—63876, S, Ug).

xVERBENA HYBRIDA Voss in Vilm., Fl. Pleine Terr., ed. 1, 936.

1865 [not V. hybrida Bicknell, 1941].

Additional & emended synonymy: Verbena hybrida Vossler apud López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 15: 89. 1975; Moldenke, *Phytologia* 30: 149, in syn. 1975. Glandularia hybrida (Voss.) López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 15: 89. 1975. Verbena genii Hort. ex Moldenke, *Phytologia* 34: 279, in syn. 1976.

Additional & emended bibliography: Vilm., Fl. Pleine Terr., ed. 1, 939—942 (1865), ed. 2, 976—979 (1866), and ed. 3, 1: 1200—1203. 1870; Vilm., Fl. Pleine Terr. Suppl. 195. 1884; Cooke, Fl. Presid. Bombay, ed. 1, 3: 437. 1906; Knoche, Fl. Balear., imp. 1, 1: 59. 1921; Wangerin in Just, Bot. Jahresber. 46 (1): 717. 1926; A. W. Anderson, How We Got Fls., imp. 1, 90 & 283. 1951; Conard, Fl. Iowa 44. 1951; Cooke, Fl. Presid. Bombay, ed. 2, imp. 1, 517—518. 1958; A. W. Anderson, How We Got Fls., imp. 2, 90 & 283. 1966; Cooke, Fl. Presid. Bombay, ed. 2, imp. 2, 2: 517—518. 1967; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717. 1969; G. W. Thomas, Tex. Pl. Ecolog. Summ. 78. 1969; R. E. Harrison, Handb. Bulbs & Peren. S. Hemisph., ed. 3, 266—267. 1971; Healy, Gard. Guide Pl. Names 225. 1972; Williamson, Sunset West. Gard. Book, imp. 11, 437. 1973; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 2, 717. 1974; Knoche, Fl. Balear., imp. 2, 1: 59. 1974; Hocking, Excerpt. Bot. A.26: 5. 1975; Kociman, Act. Bot. Neerl. 24: 464. 1975; López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 15: 89. 1975; Moldenke, *Phytologia* 30: 148—151 & 163 (1975), 31: 398 & 410—412 (1975), and 34: 263, 270, & 279. 1976; Park Seed Co., Park Seeds Fls. & Veg. 1976: 63 & 90. 1976; Soukup, Biota 11: 18. 1976; Moldenke, *Phytologia* 36: 40 & 140. 1977.

Additional illustrations: Voss in Vilm., Fl. Pleine Terr., ed. 3, 1: 1200 & 1201. 1870; R. E. Harrison, Handb. Bulbs & Peren. S. Hemisph., ed. 3, 267. 1971; Park Seed Co., Park Seeds Fls. & Veg. 1976: 90 (in color). 1976.

Misra (1970) makes the remarkable statement that xV. hybrida is a "Weed in shade" in Bihar, India, but Mukherjee also says of

it: "annual herb of waste places" in West Bengal. It would be interesting to know what cultivars are involved here and if they are breeding true or reverting to one of the several ancestral species. Blakeslee (1926) discusses the observed unlike reactions of different human individuals to the fragrance in *Verbena* flowers.

López-Palacios (1975), who found the red-flowered cultivar in cultivation at 1600 m. altitude in Ecuador and who credits the name to Vossler instead of to Voss, comments that "Esta hermosa planta jardánica está extendida por todo el territorio nacional [Venezuela]. Schauer, al hablar de la *V. peruviana*, de la que proceden las razas de flores rojas de la *V. hybrida*, dice: 'Planta floribus magnis splendide scarlatines maxime spectabilis, hortorum europeorum nunc tamen eximium decus....elegantia colorum et foliorum varietate excelentes,' Apud DC. Prodr. 9: 537, sub *V. chamaedrifolia*. Lo que puede decirse no sólo de los jardines europeos, sino de todas las partes del mundo." Actually, of course, *V. peruviana* is NOT widely cultivated in gardens any more and has been replaced by the very common *xV. hybrida*, among whose multitudinous color forms I have never yet seen anything to match the brilliant splendor of the true wild *V. peruviana*!

Stewart (1972) cites the accepted binomial for this species as "*V. hybrida* Hort. ex Vilm. Fl. Pl. Terre Suppl. 195. 1865", but the only Supplement to this work existing either in the New York or Washington libraries is a supplement to edition 3 of 1884.

Knoche (1921) reports that in the Balearic Islands this plant is called "carmelita" and is there cultivated. Duque-Jaramillo found it in flower and fruit in March at 2620 meters altitude in Colombian gardens. Thomas (1969) calls it the "hybrid verbena". Williamson (1973) lists the very modern horticultural varieties "Amethyst" and "Miss Susie".

The *Ardoin* 21, distributed as *xV. hybrida*, actually is *V. rigida* Spreng.

Additional citations: COLOMBIA: Cauca: López-Palacios & Idrobo 3832 (Ac). INDIA: West Bengal: Mukherjee s.n. [12.9.74] (Ld). CULTIVATED: Colombia: Duque-Jaramillo 2990 (N); López-Palacios 3616 (Ld, N). Czechoslovakia: Presl s.n. (Mu-4372). Ecuador: López-Palacios 4177 (Ld). Germany: Olin s.n. [June 1893] (Ac).

xVERBENA ILLICITA Moldenke

Additional bibliography: Perkins, Estes, & Thorp, Bull. Torrey Bot. Club 102: 194, 195, & 197. 1975; Moldenke, Phytologia 30: 151 (1975), 34: 250 (1976), and 36: 157. 1977.

Perkins and his associates (1975) report finding this hybrid to be the most abundant of four natural hybrids occurring in a single area in Oklahoma, there having been about 20 individuals of it as compared to 10 of *xV. goodmani* Moldenke, 1 of *xV. deamii* Moldenke, and 1 of *xV. perriana* Moldenke. A single artificially cross-pollinated plant (using *V. urticifolia* L. pollen) with 168 potential seeds had a 12.5 percent seed-set, while the parental

species, V. urticifolia, had 47.3—66.5 percent seed-set and V. stricta Vent. (when insect-pollinated) had 76.3—87.6 percent.

Additional citations: ILLINOIS: Cass Co.: Geyer s.n. [Beardstown, July 1842] (Mu—411). MISSOURI: Saint Louis: Engelmann s.n. [St. Louis] (Mu—412).

VERBENA INAMOENA Briq.

Additional bibliography: Moldenke, *Phytologia* 30: 151 (1975), 34: 279 (1976), and 36: 131. 1977.

T. Rojas 10077, cited herein under V. bonariensis L., has been annotated by an unknown hand as "Verbena bonariensis L. f. transiens in V. inamomam Briq." The Herb. Mus. Bot. Landishuth s.n., also cited by me as V. bonariensis, has all its leaves very narrow-oblong in shape and may represent V. inamoena instead.

VERBENA INCISA Hook.

Additional synonymy: Verbena arenaria Hügel ex Moldenke, *Phytologia* 34: 278, in syn. 1976 [not V. arenaria Moldenke, 1961]. Verbena arenariana Kummer ex Moldenke, *Phytologia* 34: 278, in syn. 1976.

Additional bibliography: G. Don in Loud., *Hort. Brit. Suppl.* 1: 680. 1832; Loud., *Hort. Brit.*, ed. 2, 552. 1832; Baxt. in Loud., *Hort. Brit. Suppl.* 2: 680. 1839; G. Don in Loud., *Hort. Brit. Suppl.* 2: 704. 1839; Baxt. in Loud., *Hort. Brit. Suppl.* [3]: 655. 1850; Vilm., *Fl. Pleine Terre*, ed. 1, 939 (1865), ed. 2, 2: 976 & 977 (1866), ed. 3, 1: 1200 (1870), and ed. 4, 1067. 1894; Moldenke, *Phytologia* 30: 150—152, 163, & 172 (1975), 31: 392 & 412 (1975), and 34: 270 & 278. 1976.

The corollas on Cristóbal 1210, Fabris 4688, and Krapovickas & al. 25759 & 27068 are described as having been "red", while on Herzog 1217 they were "cinnabar-red" and on Pflanz 951 "scarlet-red".

The cheironymous V. arenaria and V. arenariana listed in the synonymy above are based on specimens in the Munich herbarium collected, respectively, by Hügel in the Vienna and by Kummer in the Munich botanical garden. Don (1839) calls this species "Lady Arran's verberna".

Material of this species has been misidentified and distributed in some herbaria as V. phlogiflora Cham.

Additional citations: BRAZIL: Rio de Janeiro: Cabral s.n. [28. I. 1963; *Herb. FEEMA* 5192] (Fe). Rio Grande do Sul: Bornmüller 143 (Mu—4290). BOLIVIA: Santa Cruz: Herzog 1217 (Mu). Tarija: Pflanz 951 (Mu). PARAGUAY: T. Rojas 3406 [*Hort. Parag.* 11793] (Mu). URUGUAY: *Herb. Herter* 84884 (Mu); *Herter* 1057 [*Herb. Herter* 82941] (Mu). ARGENTINA: Catamarca: Rodríguez Vaquero 349 (Ut—330568B). Corrientes: Cristóbal 1210 (Id); Krapovickas, Cristóbal, Irigoyen, & Schinini 27068 (Id); Krapovickas, Cristóbal, Schinini, Arbo, Quarín, & González 25759 (Id). Jujuy: Fabris 4688

(Mu). Misiones: Bertoni s.n. [Herb. Inst. M. Lillo 98412] (Ld); Montes 14662 (N). CULTIVATED: Austria: Hügel s.n. [hort. Hügel Vindob. 1839] (Mu--303). Germany: Herb. Kummer s.n. [Hort. bot. Monac. 1840.IX.13] (Mu--1260, Mu--1261), s.n. [Hort. bot. Monac.] (Mu--1259). Sweden: Zetterstedt s.n. [H. L. 10 Oct. 1839] (Ac).

VERBENA INTEGRIFOLIA Sessé & Moc.

Additional & emended bibliography: Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717 (1969) and imp. 2, 717. 1974; Moldenke, Phytologia 28: 246. 1974.

xVERBENA INTERCEDENS Briq.

Additional bibliography: Moldenke, Phytologia 28: 246 & 440. 1974.

VERBENA INTERMEDIA Gill. & Hook.

Additional & emended bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 494--496. 1858; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717 (1969) and imp. 2, 717. 1974; Moldenke, Phytologia 30: 152 (1975) and 31: 387 & 409. 1975.

Pedersen encountered this plant on "black earth" grasslands in Corrientes and Job found it on dunes in Buenos Aires. The corollas on Herter 1155 are said to have been "lilac-blue" when fresh.

Additional citations: URUGUAY: Herter 1155 [Herb. Herter 83295] (Mu). ARGENTINA: Buenos Aires: Job 1597 (Ut--330533B). Corrientes: Pedersen 4660 (N).

VERBENA JORDANENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 28: 354 (1974) and 30: 192. 1975.

VERBENA KUHLMANNII Moldenke, Phytologia 31: 29. 1975.

Bibliography: Moldenke, Phytologia 31: 29 & 387. 1975; Anon., Biol. Abstr. 61: ACl.732. 1976.

Citations: BRAZIL: São Paulo: M. Kuhlmann 3717 [Herb. Inst. Bot. S. Paulo 79535] (W--2748267--type, Z--photo of type, Z--photo of type).

VERBENA LACINIATA (L.) Briq.

Additional bibliography: Sweet, Hort. Brit., ed. 2, 419. 1830; G. Don in Loud., Hort. Brit., ed. 1, 247 (1830) and ed. 2, 247. 1832; G. Don in Loud., Hort. Brit. Suppl. 1: 680. 1832; Loud., Hort. Brit., ed. 2, 552. 1832; Baxt. in Loud., Hort. Brit. Suppl. 2: 680. 1839; G. Don in Loud., Hort. Brit., ed. 3, 247. 1839; Baxt. in Loud., Hort. Brit. Suppl. [3]: 655. 1850; Buek, Gen. Spec. Syn. Candoll. 3: 494 & 495. 1858; Vilm., Fl. Pleine Terr., ed. 1, 937 (1865), ed. 2, 2: 974 (1866), ed. 3, 1: 1197--1198 (1870), and ed. 4, 1066 & 1070. 1894; A. W. Anderson, How We Got Fls., imp. 1, 168 & 283 (1951) and imp. 2, 168 & 283. 1966; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1,

715--717 (1969) and imp. 2, 715--717. 1974; Hinton & Rzedowski, Anal. Esc. Nac. Cienc. Biol. 21: 111. 1975; Kocinan, Act. Bot. Neerl. 24: 464. 1975; López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 94. 1975; Moldenke, Phytologia 30: 152--153 & 172 (1975), 31: 383, 410, & 411 (1975), and 34: 259 & 260. 1976; Soukup, Biota 11: 19. 1976; E. H. Walker, Fl. Okin. & South. Ryuk. 884. 1976; Moldenke, Phytologia 36: 128, 139, & 148. 1977.

Additional illustrations: Voss in Vilm., Fl. Pleine Terr., ed. 4, 1066. 1894.

Fosberg encountered this plant in grassy places grazed by goats on the top of a low hill and the corollas on no. 27645 are said to have been "lavender" when fresh, while on Grandjot s.n. [XI.32] they were "rose-violet" in color.

Don (1830) lists V. multifida Ruiz & Pav. as a synonym of V. erinoides Willd. and implies that it, like V. erinoides, was introduced into English gardens from Peru in 1818. Tawada (1967) reports "V. erinoides Lamarck" as cultivated in Okinawa, but probably this is an error in identification for V. tenuisecta Briq. It should be noted here that Walker (1976) gives "1968" as the correct publication date for Tawada's work.

The Lorentz 478, distributed as V. laciniata, actually is V. aristigera S. Moore, while Merxmüller 24804 is V. berterii (Meisn.) Schau., Collector undetermined s.n. [H. L. 1840], is V. bipinnatifida Nutt., Lossen 72 is V. glandulifera Moldenke, Herter 1805 and Herb. Herter 96556 are V. pulchella Sweet, Martius s.n. [ad S. Joaõ d'El Rey, Febr.] is V. regnelliana Moldenke, Herter 181 and Herb. Herter 79174 are V. selloi Spreng., and Brizle s.n., Herb. Hort. Monac. s.n., and Herb. Merxmüller 14336, as well as Kupper s.n. [cult. h. b. M.] are V. tenuisecta Briq.

Additional citations: ECUADOR: Cañar: Herb. Univ. Cent. Quito 2350 (Mu). Chimborazo: F. R. Fosberg 27645 (N). BOLIVIA: La Paz: O. E. White s.n. [2-18-1963] (W--2774548). CHILE: Concepcion: Neger s.n. [1893--96] (Mu--3981). Malleco: Baeza s.n. [19.XII. 1913] (Mu--4330). Santiago: Grandjot s.n. [XI.32] (Mu, Mu). Valparaíso: Behn s.n. [Quilpué, 2.X.1932] (Mu), s.n. [Valparaíso, 1 Okt. 1922] (Mu); O. Buchtien s.n. [8.IX.1895] (Mu--1837); Kausel s.n. [Limache, 16.X.27] (Mu). Province undetermined: Dusen s.n. [Chili australis 1896--97] (Mu--2982); Reuca s.n. [1889] (Mu--4322). MOUNTED ILLUSTRATIONS: Ruiz & Pav., Fl. Peruv. & Chil. 1: pl. 33, fig. 2. 1797 (N, Z).

VERBENA LACINIATA var. CONTRACTA (Lindl.) Moldenke

Additional bibliography: G. Don in Loud., Hort. Brit., ed. 1, 247 (1830), ed. 2, 247 (1832), and ed. 3, 247. 1839; Baxt. in Loud., Hort. Brit. Suppl. [3]: 655. 1850; Buek, Gen. Spec. Syn. Candoll. 3: 494 & 495. 1858; Moldenke, Phytologia 30: 153 (1975) and 31: 410 & 411. 1975.

Don (1830) calls V. erinoides the "Erimus-like vervain" and

claims that it was introduced into English gardens from Peru in 1818 probably in this contracted form.

VERBENA LASIOSTACHYS Link

Additional bibliography: Sweet, Hort. Brit., ed. 2, 418 & 419. 1830; G. Don in Loud., Hort. Brit., ed. 1, 246 & 247 (1830) and ed. 2, 246 & 247. 1832; Loud., Hort. Brit., ed. 2, 552. 1832; G. Don in Loud., Hort. Brit., ed. 3, 246 & 247. 1839; Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Kooiman, Act. Bot. Neerl. 24: 464. 1975; Moldenke, Phytologia 30: 153 (1975), 34: 251 (1976), and 36: 135. 1977.

Don (1830) places V. lasiostachys in his Section Indivisae (with undivided leaves), calls it the "hairy-spiked vervain", and says that it was introduced into English gardens from California in 1826, while V. prostrata is placed in his Section Trifidae, calls it the "prostrate vervain", and gives the date of its introduction from "N. Amer." as 1794.

The Herb. Schwaegrichen s.n. [1837], Herb. Zuccarini s.n. [Hort. Bot. Monac. 1835, 1836], Raven 2951, and Thorne & Tilforth 39918, distributed as typical V. lasiostachys, actually seem to represent var. septentrionalis Moldenke, while Meebold 20234 is V. robusta Greene.

Additional citations: CALIFORNIA: Humboldt Co.: Moldenke & Moldenke 30232 (Ac, Gz, Kh, Ld, Ln, Mu, Tu, Ut, W). Santa Barbara Co.: Meebold 22111 (Mu). Santa Cruz Co.: M. E. Jones 2215 (Mu—1575).

VERBENA LASIOSTACHYS var. SEPTENTRIONALIS Moldenke

Additional bibliography: Moldenke, Phytologia 30: 153 (1975) and 36: 135. 1977.

Recent collectors have encountered this plant in dry places and "a few feet above high-tide line on coastal cliffs", at altitudes of 2—30 meters, and describe it as a widely branching herb, 6 dm. tall. The corollas are said to have been "blue" on Witham 508, "purplish" on Thorne & Tilforth 39918, and "purple" on Beauchamp 2523.

Material of this variety has been misidentified and distributed in some herbaria as V. bracteata Lag. & Rodr.

Additional citations: OREGON: Josephine Co.: Baker & Ruhle 434 (N). CALIFORNIA: Alameda Co.: Meebold 19930 (Mu); Nichener & Biolletti s.n. [Oakland, June 1891] (Ml). Butte Co.: Moldenke & Moldenke 30339 (Gz, Mu, Tu, Ut). Los Angeles Co.: Gallup s.n. [8/13/1949] (Sd—72252); Meebold 20050 (Mu); Thorne & Tilforth 39918 (Kl—16018). Nevada Co.: M. E. Jones 2598 (Ln—70251, Mu—1576). San Diego Co.: Beauchamp 2523 (Sd—85664); M. F. Spencer 1037 (Mu—4319); Witham 1454 (Sd—80427). San Luis Obispo Co.: Edw. Palmer 342 (Mu—1555); Raven 2951 (Ac); Witham 508 (Sd—75714). Shasta Co.: Moldenke & Moldenke 30260 (Ac, Ld, W). CULTIVATED: Germany:

Herb. Schwaegrichen s.n. [1837] (Mu—1267); Herb. Zuccarini s.n. [Hort. Bot. Monac. 1835] (Mu—367), s.n. [Hort. Bot. Monac. 1836] (Mu—368), s.n. [Hort. Bot. Monac.] (Mu—369).

VERBENA LILACINA Greene

Additional bibliography: Moldenke, *Phytologia* 30: 153. 1975.

Recent collectors describe this species as a dense bush or subshrub, 2—5 feet tall, growing in the steep north slopes of canyons, along the sides of large granite boulders, at altitudes of 5—50 meters, flowering and fruiting in March, April, and July. Moran reports it as "common in arroyos". The corollas are said to have been "lavender" in color on Moran 17123, 17127, & 17185.

Additional citations: MEXICO: Baja California: Bostic s.n. [2 July 1969] (Sd—70839); R. V. Moran 17123 (Sd—76988), 17127 (Sd—76989), 17185 (Sd—76987).

VERBENA LINDBERGI Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 288 (1972) and 31: 387. 1975.

Merxmüller encountered this species at 2350 meters altitude, flowering in December.

Additional citations: BRAZIL: Rio de Janeiro: Merxmüller 25555 (Mu).

VERBENA LIPOZYGIOIDES Walp.

Additional bibliography: Buek, *Gen. Spec. Syn. Candoll.* 3: 495. 1858; Moldenke, *Phytologia* 28: 354. 1974.

VERBENA LITORALIS H.B.K.

Additional synonymy: Verbena atriota Pabst ex Moldenke, *Phytologia* 34: 278, in syn. 1976.

Additional & emended bibliography: G. Don in Loud., *Hort. Brit. Suppl.* 1: 680. 1832; Burt. in Loud., *Hort. Brit. Suppl.* 2: 680 (1839) and [3]: 655. 1850; Buek, *Gen. Spec. Syn. Candoll.* 3: 494 & 495. 1858; Robledo, *Bot. Med.* 392. 1924; Barriga-Bonilla, Hernández-Camacho, Jaramillo-T., Jaramillo-Mejía, Mora-Osejo, Pinto-Escobar, & Ruiz-Carranza, *Isla San Andrés* 59. 1969; G. W. Thomas, *Tex. Pl. Ecolog. Summ.* 78. 1969; Bolkh., Grif, Matvej., & Zakhar., *Chromb. Numb. Flow. Pl.*, imp. 1, 717. 1969; Hartwell, *Lloydia* 34: 387. 1971; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.*, imp. 2, 717. 1974; Gibbs, *Chemotax. Flow. Pl.* 3: 1753 & 1754. 1974; Balgooy, *Pacif. Pl. Areas* 3: 245. 1975; O. & I. Degener & Pekelo, *Hawaii. Pl. Names* x.4, x.21, & x.22. 1975; Hinton & Rzedowski, *Ann. Esc. Nac. Cienc. Biol.* 21: 31 & 111. 1975; Kooiman, *Act. Bot. Neerl.* 24: 464. 1975; López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 15: 51 & 90—93, fig. [17]. 1975; Molina R., *Ceiba* 19: 95. 1975; Tovar Serpa, *Biota* 10: 286 & 298. 1975; Moldenke, *Phytologia* 30: 136 & 153—154 (1975), 31: 378, 379, 383, & 392 (1975), and 34: 256, 260, 267, 270, & 278. 1976; López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 17: 50. 1976; Soukup, *Biota* 11:

19. 1976; E. H. Walker, Fl. Okin. & South. Ryuk. 883 & 884. 1976; Moldenke, Phytologia 36: 31, 33, 47, 51, 52, 122, 131, 136, 137, & 151. 1977.

Additional illustrations: López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: fig. [17]. 1975.

Molina R. refers to this species as a "weed common in sugarcane plantations" in Nicaragua. Walker (1976) calls it "A weed of roadsides and waste places" on Okinawa, while Schlieben reports it "very abundant" on bush savannas in the Transvaal. On Saipan island Stone found it to be a "common weed with Asclepias curassavica, Conyza, Cardiospermum, etc." Herbst speaks of it as "uncommon" on Hawaii island. Werff found it in the moist zone on Chatham island in the Galápagos and comments that there its flowers were "not as intensely colored as those of 2182 [V. brasiliensis Vell.]". Bianco describes it as 0.8-1.3 meters tall and "medicinal" in Venezuela; Taylor found it on steep roadside banks in Costa Rica.

The inflorescence tips on Molina R. 27244 are much congested because they are insect-galled; the corollas are said to have been "lilac" in color when fresh, as they were also on his no. 11508, on Hatschbach & Kummrow 35764, Romero-Castañeda 10668, and Schlieben 7691. They are said to have been "violet" on Pabst 7372 and Schinini & al. 10259, "blue" on Behn s.n. [14 Decbr. 1930], "blue-violet" on Flowerman & Davis 4889, "bluish-violet" on Stone 5233, "pretty purple" on Clemens 42170, and "pale-blue" on Herbst 2296. On López-Palacios 4220 & 4332 they are described as "moradas", on 4196 "morado lila", on 4100 "lila", and on 4040 "azul morado hasta morado muy claro".

Hatschbach & Kummrow report V. litoralis being used medicinally in Brazil, while in Peru, according to Flowerman & Davis, the dried ground-up leaves are placed on wounds.

It is not certain to what species Gibbs (1974) is referring when he uses the name "Verbena arborea", but such a binomial has been used for V. litoralis in the horticultural trade.

López-Palacios (1975) comments that "En París, en el Herbario HB, existe el N. 658 [of Bonpland], determinado como V. caracasana, que bien puede ser el tipo o, cuando menos, el esótipo" [of var. caracasana]. He continues: "Yo he examinado el material de Willdenow y no encuentro diferencia alguna con la V. litoralis HBK. El espécimen 11134 Willd., Verbena lanceolata, corresponde al 638 de Humboldt (P), rotulado quizás por él mismo, o por Bonpland, V. caracasana, pero en mi concepto, no creo que alcance ni siquiera a una diferencia de variedad de la V. litoralis. También las poblaciones son iguales, y no se observa diferencia entre las de Caracas y las de Mérida, p. e. De la V. glabrata no hay constancia segura de que exista en el territorio venezolano. El ejemplar de Mocquers, Duaea 893 ? No o fecha?), determinado por Doffa N. Troncoso como V. glabrata es, simplemente, V. litoralis."

Muchos las consideran como coespecíficas.....Para mí es difícil establecer la diferencia entre las dos especies. [actually V. glabrata H.B.K. as seen so abundantly in Ecuador is very easily distinguished in general aspect from V. litoralis!]. De existir en Venezuela, sería probablemente en Táchira y Zulia, hasta donde pueden extenderse las poblaciones colombianas del Norte de Santander, en donde la V. glabrata ha sido registrada."

López-Palacios 3638 is a close match for the type illustration of V. litoralis, but his 3948 is the very widespread loosely fruited form, while his 3623 is the very dense-flowered and -fruited form now passing as var. caracasana. He reports that the plants growing in his own garden and represented by his no. 3974 were 80-100 cm. tall. In a letter to me, dated January 16, 1976, he says: "Por correo le envés 5 ejemplares de Verbena litoralis colectados de una misma planta que yo tengo cultivada. Este taxon es polimórfico y variable no sólo en la población sino en la misma planta, como Ud. podrá observar; en hojas y en espigas la variación es grande. Yo ví en Herb. Willdenow el tipo de la var. caracasana, pero en mi concepto todo ello es simplemente V. litoralis. Naturalmente esto es una cosa subjetiva y se deba a mi formación, influida por las escuelas europeas (Holandesa y Alemana) que tienen un criterio muy amplio de la especie. Naturalmente el dibujo de HBK sólo muestra un estadio de crecimiento y por tanto no puede registrar todas las variaciones de la especie." He suggests that his 4161 may be a form of V. brasiliensis Vell., and this is, indeed, very possible. It is also most probable that these two species hybridize when growing in close proximity, as they often do. His no. 4302, from the Galápagos islands, is described as "hierba de hojas medianas, espigas congestas luego alargadas".

Walker (1976) reports for V. litoralis the vernacular name, "hime-kuma-tsuzura" [=small delicate V. officinalis] on Okinawa. Witham collected the species at 1000 m. altitude in Hawaii, describing it as a "tough perennial" with blue flowers. Tovar Serpa (1975) records the vernacular name, "wirwena", for it in Peru. The Degeners & Pekelo (1975) list the names, "ha'uōwī", "oi", and "ōwī", in Hawaii; Thomas (1969) calls it the "coast verbena".

Gibbs (1974) reports that in what he calls "Verbena arborea" cyanogenesis is absent from the leaves and syringin is absent from the stems. It is not definitely known if he refers here to V. litoralis or to Petrea arborea, for both of which taxa the name "Verbena arborea" has in the past been used in literature. Hartwell (1971) reports that in Mexico V. litoralis is called "verbena del campo" and that the twigs are used to make a decoction drunk in the treatment of internal tumors. Krapovickas and his associates report its use in Salta, Argentina, "para golpe, paea sangre". Krapovickas, Schinini, & González 28440 represents the dense-spiked form of the species.

The Widgren s.n. [1845], distributed as V. litoralis, actually

is V. alata Sweet, while Lechler s.n. [Valdivia], Leyboldt s.n., and Montz 2289 are V. bonariensis L., Fabris & Marchionni 2392 is a mixture of V. litoralis and V. bonariensis, Behn s.n. [Quilpué, 22 January 1931], Bougere 14, 1091, & 1099, C. A. Brown 1008, 2309, 2381, & 18610, Bynum, Ingram, & Jaynes s.n. [Houma, Apr. 23, 1933], M. Chaney 111, Claycomb s.n. [June 13, 1942], Heinrichs 65, Kirby 160, D. K. Lowe 31, Meebold 27224 & 27240, Montz 637, J. A. Moore 5200, Neger s.n. [1893—96], Robinette 239, Rockett 125, Roivainen 3054, and Stutzenbaker 205 are V. brasiliensis Vell., Heyde & Lux 3019 is V. carolina L., O. Buchtien 185 is xv. dermeni Moldenke, Claycomb s.n. [April 15, 1943] is V. halei Small, C. A. Brown 18767, Herb. Herter 81713, Herter 269, and Thibodeaux 236, 260, 284, 297, 321, & 417 are V. montevidensis Spreng., J. Taylor 17625 is V. parvula Hayek, and Schimpff 132 is V. sedula Moldenke.

Additional citations: LOUISIANA: Terrebonne Par.: Wurzlow s.n. [May 5, 1914] (Lv, Lv). MEXICO: Oaxaca: Pringle 4877 (Mu—1803). Veracruz: Kerber 311 (Mi, Mu—1791). GUATEMALA: Guatemala: L. M. Andrews 507 (N). Santa Rosa: Heyde & Lux 4370 (Mu—1790). HONDURAS: Cortes: Molina R. 11508 (W—2735773). NICARAGUA: Estelí: Molina R. 27244 (N, W—2735237). COSTA RICA: San José: J. Taylor 17446 (N). COLOMBIA: Arauca: López-Palacios 3948 (Ld, N). Cundinamarca: López-Palacios 3623 (Ld, N), 3638 (Ld, N); López-Palacios & Jaramillo Mejía 3674 (Ld, N). Magdalena: Romero-Castañeda 10668 (N). VENEZUELA: Aragua: Vogl 938 (Mu, Mu, Mu). Mérida: Oberwinkler & Oberwinkler 12196 (Mu). Miranda: Pittier 442 (Mu). ECUADOR: Carchi: López-Palacios 4040 (Ld). Chimborazo: Collector undetermined s.n. [September 1858] (Mu—1105). El Oro: López-Palacios 4100 (Ld). Guayas: Eggers 14372 (Mu—3882). Imbabura: López-Palacios 4072 (Ld). Loja: López-Palacios 4161 (Ld). Pichincha: López-Palacios 4196 (Ld), 4220 (Ld), 4332 (Ld). GALÁPAGOS ISLANDS: Chatham: Schimpff 142 (Mu); Werff 2183 [1483] (Ld), 2186 [1486] (Ld). Narborough: López-Palacios 4302 (Ld). PERU: Cuzco: Plowman & Davis 4889 (Oa). BRAZIL: Minas Gerais: Irwin, Harley, & Onishi 28721 (W—2759077). Rio de Janeiro: Pabst 7372 (Mu). BOLIVIA: La Paz: M. Bang 204 (Mu—1788). PARAGUAY: Pedersen 8625 (N); T. Rojas 1889 (Mu). CHILE: Valparaíso: Behn s.n. [14 Decbr. 1930] (Mu); O. Buchtien s.n. [18.X.1895] (Mu—1838). Province undetermined: Dessauer s.n. [Chile, VI-IX-87] (Mu); Frömbing s.n. [Chile, 1886] (Mu—1789). ARGENTINA: Jujuy: Schinini, Quarín, Arbo, & Pire 10259 (Ld). Salta: Krapovickas, Schinini, & González 28440 (Ld). San Juan: Fabris & Marchionni 2392, in part (Mu). Santiago del Estero: Lullo 4 (Ut—220576B); Pierotti "h" [6-II-1944] (Ut—330535B). SOUTH AFRICA: Transvaal: Meebold 12839 (Mu); Scheepers 334 (Mu); Schlie-

ben 7691 (Mu). MARIANAS ISLANDS: Saipan: B. C. Stone 5233 (Kl)...
 AUSTRALIA: Queensland: M. S. Clemens 42170 (Ml); Meebold 7818 (Mu).
 HAWAIIAN ISLANDS: Hawaii: Witham 1713 (Sd—83745). Kauai: Herbst 2296 (N). Oahu: Meebold 8304 (Mu); Schmer s.n. [9/13/69] (Lc).
 CULTIVATED: Brazil: Hatschbach & Kummrow 35764 (Ld). Germany:
Herb. Kummer s.n. [Hort. bot. Monac. 1839] (Mu—1248). Venezuela:
Bianco 110 (N); López-Palacios 3974 (Ac, Gz, Mu, Tu).

VERBENA LITORALIS var. ALBIFLORA Moldenke

Synonymy: Verbena littoralis var. albiflora Moldenke ex Hinton
 & Rzedowski, Anal. Esc. Nac. Cienc. Biol. 21: 111. 1975.

Additional bibliography: Moldenke, Phytologia 28: 252, 432, &
 438. 1974; Hinton & Rzedowski, Anal. Esc. Nac. Cienc. Biol. 21:
 31 & 111. 1975; Soukup, Biota 11: 19. 1976; Moldenke, Phytologia
 36: 47. 1977.

VERBENA LITORALIS var. CARACASANA (H.B.K.) Moldenke

After extensive field and herbarium studies, including an examination of the type collection, López-Palacios has shown that this taxon cannot be distinguished from typical V. littoralis H.B.K. All my previous notes in this series under this heading should therefore be transferred to typical V. littoralis.

VERBENA LITORALIS f. MAGNIFOLIA Moldenke, Phytologia 36: 51—52. 1977.

Bibliography: Moldenke, Phytologia 36: 33 & 51—52. 1977.

Citations: ECUADOR: Napo: López-Palacios 4188 (Z—type).

VERBENA LOBATA Vell.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 494 & 495. 1858; Moldenke, Phytologia 30: 154. 1975.

The Hatschbach HH.14883 and Herb. Brad. 48010, distributed as V. lobata, actually represent var. sessilis Moldenke.

Additional citations: BRAZIL: Minas Gerais: Dusén 242 (Mu—3998). Rio de Janeiro: A. Castellanos 25682 [Herb. FREMA 4520] (Ld). Rio Grande do Sul: Bornmüller 602 (Mu—4295).

VERBENA LOBATA var. HIRSUTA Moldenke

Additional bibliography: Moldenke, Phytologia 28: 253. 1974.

The corollas are said to have been "lilac" in color when fresh on Hatschbach 35664.

Additional citations: BRAZIL: Paraná: Hatschbach 35664 (Ld).

VERBENA LOBATA var. SESSILIS Moldenke

Additional bibliography: Moldenke, Phytologia 28: 355. 1974.

The corollas on Hatschbach HH.14883 are said to have been "dark-lilac" in color when fresh, and this collector encountered the plant in "brejo" (sedge meadow), flowering in October. It was distributed in some herbaria as typical V. lobata Vell.

Additional citations: BRAZIL: Paraná: Hatschbach HH.14883 [Herb.

Brad. 48010] (Mu).

VERBENA LONGIFOLIA Mart. & Gal.

Additional synonymy: Verbena longifolia H.B.K. ex Moldenke, Phytologia 36: 47, in syn. 1977.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Moldenke, Phytologia 23: 296 (1972), 34: 252 (1976), and 36: 47 & 145. 1977.

The corollas are said to have been "white to pale-pink" on Ernst 2355a.

Additional citations: MEXICO: Oaxaca: Ernst 2355a (Mi).

VERBENA LONGIFOLIA f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 28: 253 (1974), 34: 252 (1976), and 36: 145. 1977.

Martínez Calderón refers to this plant as an annual herb which he encountered at 5 m. altitude in "suelo arcilloso-arenoso in acahual" and which he misidentified and distributed as V. carolina L. The Ernst 2355a, cited under typical V. longifolia (above), is said to have come from a population with white to light-pink flowers so it may, in part, at least, also represent this form.

Additional citations: MEXICO: Veracruz: Martínez Calderón 1352 (N).

VERBENA LUCANENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 23: 297. 1972; Soukup, Biota 11: 19. 1976.

VERBENA MACDOUGALII Heller

Additional & emended bibliography: Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717. 1969; G. W. Thomas, Tex. Pl. Ecol. Summ. 78. 1969; Fong, Trojánková, Trojáněk, & Farnsworth, Lloydia 35: 147. 1972; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 2, 717. 1974; R. D. Gibbs, Chemotax. Flow. Pl. 3: 1753 & 1754 (1974) and 4: 2295. 1974; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S., imp. 2, 2: 1397, 1399--1400, & 1775. 1975; Kociman, Act. Bot. Neerl. 24: 464. 1975; A. L. Moldenke, Phytologia 31: 415. 1975; Moldenke, Phytologia 30: 154 (1975) and 36: 145. 1977.

The Spellenbergs encountered this plant "along dirt road with grasses, in Douglas fir, Pinus, Quercus, and Holodiscus" association. Pinkava and his associates found it along roadsides in ponderosa pine forests — a habitat apparently identical to that in which my wife, my son, and I saw it in great abundance and which seems to be its favorite habitat. Higgins reports finding it in sandy soil of "short-grass prairie community", in sandy soil of "spruce-fir-pine community", and in "coarse sandy to gravelly soil in mountain brush and mixed evergreen community and aspen scattered in patches". Dziekanowski and his associates observed it in "very rocky yellow pine forests".

The corollas are said to have been "violet, fading to blue" on

Spellenberg & Spellenberg 2082. Thomas (1969) calls the species the "Macdougall verbena".

Gibbs (1974) reports cyanogenesis absent in the leaves of V. macdougallii and the Ehrlich test negative, but syringin is doubtfully present in the stems.

Material has been misidentified and distributed in some herbaria as V. hastata var. scabra Moldenke.

Additional citations: COLORADO: Archuleta Co.: C. F. Baker s.n. [Arboles, 7-10-99] (Mu—3912). NEW MEXICO: Otero Co.: Spellenberg & Spellenberg 2082 (N). Lincoln Co.: Higgins 8604 (N). San Miguel Co.: Higgins 8881 (N). Taos Co.: Higgins, Higgins, & Rook 10040 (N); Waterfall 12250 (M). Yavapai Co.: H. H. Rusby 780, in part (Mu). ARIZONA: Apache Co.: Lehto, McGill, Nash, & Pinkava 11506 (W—2734642); Pinkava, Lehto, & Reeves P.12352 (N). Coconino Co.: Dzieskanowski, Dunn, & Bennett 2395 (N).

VERBENA MACDOUGALLII f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 253, 254, & 431. 1974.

VERBENA MALMII Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 298. 1972; Troncoso, *Darwiniana* 18: 311 & 412. 1974.

Hatschbach describes this species as growing from a xylopodium. He found it on dry campos, flowering in December, and the corollas on his no. 35553 are said to have been "lilac" in color when fresh.

Additional citations: BRAZIL: Paraná: Hatschbach 35553 (Ld).

VERBENA MARITIMA Small

Additional synonymy: Verbena maritima Sm. ex Norman, *Fla. Scientist* 39: 30. 1976.

Additional bibliography: M. F. Baker, *Fla. Wild Fls.*, ed. 2, imp. 1, 188. 1938; Ayensu, *Rep. Endang. & Threat. Pl. Spec.* 98 & 129. 1974; Moldenke, *Phytologia* 28: 254, 451. & 464 (1974) and 34: 248 & 279. 1976; M. F. Baker, *Fla. Wild Fls.*, ed. 2, imp. 2, 188. 1976; Long & Lakela, *Fl. Trop. Fla.*, ed. 2, 741 & 961. 1976; Norman, *Fla. Scientist* 39: 30. 1976; Moldenke, *Phytologia* 36: 142. 1977.

Ayensu (1974) has officially listed this as an endangered or threatened species. With the rapidity of the commercialization of the Florida beaches, the survival of this species, limited to that specialized habitat, is certainly in great doubt.

Churchill has encountered V. maritima in pine flatwoods on oolitic limestone and on the lee side of dunes, as well as in dune hollows, in flower and fruit in March and June. Norman (1976) calls it the "seaside verbena" and justifiably refers to it as already "rare".

Additional citations: FLORIDA: Brevard Co.: Curtiss 1963* (Mu—1545). Broward Co.: Meebold 27688 (Mu). Dade Co.: J. A. Church-

111 s.n. [12 March 1956] (Ln--204149). Martin Co.: J. A. Church-
111 s.n. [18 June 1968] (Ln--225090). Long Key: J. K. Small 8123
 (Mu).

VERBENA MARRUBIODES Cham.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Moldenke, Phytologia 30: 154. 1975; Soukup, Biota 11: 19. 1976.

Recent collectors have encountered this plant along roadsides on campos and in "campo com pequeno banhado". The corollas are said to have been "red (5P6/8)" on Lindeman, Irgang, & Valls ICN. 8805 and "blue-purple (10PB5/8)" on Lindeman & Haas 2459.

Reineck & Czermak 21 is a mixture of V. marrubioides and V. humifusa Cham.

Additional citations: BRAZIL: Paraná: Lindeman & Haas 2459 (Id). Rio Grande do Sul: Lindeman, Irgang, & Valls ICN.8805 (Ut--320456); Reineck & Czermak 21, in part (Mu).

VERBENA MEDICINALIS Rojas

Additional & emended bibliography: Krapovickas, Bol. Soc. Argent. Bot. 11, Supl. 269. 1970; Moldenke, Phytologia 30: 154--155 (1975) and 31: 388. 1975.

VERBENA MEGAPOTAMICA Spreng.

Additional synonymy: Verbena phlogiflora  macilenta Cham. ex Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858.

Additional & emended bibliography: Loud., Hort. Brit., ed. 2, 552. 1832; Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 715 (1969) and imp. 2, 715. 1974; Moldenke, Phytologia 30: 155 & 178 (1975) and 36: 47. 1977.

The label on Krapovickas & Cristóbal 28956 bears the statement "en campos pantanosos, erecta, flores amarillas" -- if the corolla color given here is correct this represents a remarkable undescribed color-form, but it seems more probable to me that it represents a mistake in memory or transcription.

The Hort. Parag. 11793 and T. Rojas 3406, distributed as V. megapotamica, actually are V. incisa Hook., while Duarte 6309, Herb. Brad. 16885 & 22512, Pabst 6093, and E. Pereira 6266 are V. phlogiflora Cham.

Additional citations: ARGENTINA: Corrientes: Krapovickas & Cristóbal 28956 (Id).

VERBENA MEGAPOTAMICA Spreng. x V. PULCHELLA Sweet

Additional bibliography: Moldenke, Phytologia 28: 255, 451, & 464. 1974.

VERBENA MENDOCINA R. A. Phil.

Additional & emended bibliography: Bolkh., Grif, Matvej., & Zak-

har., Chrom. Numb. Flow. Pl., imp. 1, 715 & 717 (1969) and imp. 2, 715 & 717. 1974; Moldenke, Phytologia 30: 155. 1975.

VERBENA MENTHAEFOLIA Benth.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 495 & 496. 1858; G. W. Thomas, Tex. Pl. Ecolog. Summ. 78. 1969; Moldenke, Phytologia 28: 355 & 362 (1974) and 30: 159. 1975; Hinton & Rzedowski, Anal. Esc. Nac. Cienc. Biol. 21: 31 & 111. 1975; Moldenke, Phytologia 36: 145. 1977.

Recent collectors have encountered this plant on rocky hills with thin gravelly soil and oak-pine grassland cover. Mears found it growing in association with Cassia, Mimosa, Juniperus, Solanum, Cuphea, Quercus, Indigofera, and Phoradendron. In Baja California it is reported by Moran as "occasional", "abundant in roadside depressions", "common in roadside ditches", and "locally common in several places on dry open southeast slopes", at 10 to 200 meters altitude, describing it as a "decumbent bush" or "prostrate". The corollas are described as having been "blue" on Moran 16643 & 18675, "blue-violet" on Moran 16098, 18563, & 21824, "purple" on Witham 783, and "light-blue, with white center" on Moran 22459. Thomas (1969) calls it the "mintleaf ver-bena", a singularly inappropriate name since its leaves do not resemble those of any typical mint with which I am familiar. The Baja California material ascribed to this species needs to be more carefully compared to V. comoduensis Moldenke, a closely related taxon.

Additional citations: CALIFORNIA: San Diego Co.: R. V. Moran 16098 (Sd-71707); Spencer s.n. [4.25.1916] (Mu-4318); Witham 783 (Sd-79855). MEXICO: Baja California: R. V. Moran 16643 (Sd-73069), 18563 (Sd-80229), 18675 (Sd-80255), 21824 (Sd-91272), 22459 (Sd-91088). Federal District: Barkley & Rowell 7464 (Ln-166003). Hidalgo: Mears 259d (Ln-222126), 326d (Ln-222197). México: Pringle 8534 (Mu-3989). Zacatecas: Taylor & Taylor 6230 (W-2734032).

VERBENA MICROPHYLLA H.B.K.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 495. 1858; Moldenke, Phytologia 30: 155. 1975; Soukup, Biota 11: 19. 1976.

Schultes has placed an interesting note on the M. Wagner s.n. [Sept. 1858] sheet at Munich: "Verbena erinoidi Lam. proxima sed ipse vix videtur. An V. multifida R. & Pavon quae a Schanero Verbenae erinoidi subjungitur".

Legname & Vervoort refer to V. microphylla as a "prostrate hemicryptophyte" and encountered it in "terreno arenoso-arcilloso" -- the corollas on their no. 101 were "pale-lilac" when fresh.

Additional citations: ECUADOR: Chimborazo: Schimpff 720 (Mu); M. Wagner s.n. [Sept. 1858] (Mu-1104). Cotopaxi: M. Wagner s.n. [October 1858] (Mu-1262). Province undetermined: M. Wagner s.n.

[Tacunga, Octob.--Nov. 1858] (Mu—1263). PERU: Cuzco: W. Hoffmann 307 (Mu). BOLIVIA: La Paz: O. Buchtien 1102 (Mu); K. Graf 453 (N). Oruro: Troll 2919 (Mu). Potosí: Fiebrig 2613 (Mu—4088). Province undetermined: K. Graf 599 [Taurichambi] (N). ARGENTINA: Catamarca: Legname & Vervoorst 101 (N). Jujuy: Cabrera, Ancibor, Ré, Tello, & Torres 15474 (Mu); Ellenberg 4259 (Ld), 4261 (Ac). Province undetermined: Princess Therese of Bavaria 282 (Mu).

VERBENA MINUTIFLORA Briq.

Additional bibliography: Moldenke, *Phytologia* 28: 356 & 383 (1974) and 36: 36 & 123. 1977.

In addition to the months previously reported by me, this plant has been collected in fruit in March and October. It has been described by Lindeman & Haas as an almost leafless shrub, 1.5 m. tall, and the corollas on their no. 3010 are said to have been "purple" when fresh. On Lindeman ICN.9446 the collector notes "arbusto de 1.70 m., 1.5 cm. diam., corola roxa 10PB7/6", and it was encountered by him in a "pequeno banhado quase seco".

Davidse and his associates report that in Santa Catarina it is used in the treatment of stomach and digestive ailments.

Material of V. minutiflora has been misidentified and distributed in some herbaria as V. alata Sweet.

Additional citations: BRAZIL: Paraná: Hatschbach 37374 (Ld); Lindeman & Haas 3010 (Ws). Rio Grande do Sul: Lindeman ICN.9446 (Ut—320459). Santa Catarina: Davidse, Ramanooorthy, & Vital 11089 (Ld). ARGENTINA: Toledo Island: Ibarrola 739 (Ut—330572B).

xVERBENA MOECHINA Moldenke

Additional synonymy: Verbena moenchina Moldenke ex R. A. Davidson, *State Univ. Iowa Stud. Nat. Hist.* 20 (2): 77, sphalm. 1959.

Additional bibliography: R. A. Davidson, *State Univ. Iowa Stud. Nat. Hist.* 20 (2): 77. 1959; Cooperrider, *State Univ. Iowa Stud. Nat. Hist.* 20 (5): 70. 1962; Moldenke, *Phytologia* 28: 356, 386, 387, 429, & 465 (194), 34: 249 (1976), and 36: 29 & 47. 1977.

Tans encountered this hybrid along roadsides and in an abandoned quarry on limestone gravel in association with native prairie plants such as Asclepias verticillata, Andropogon gerardi, Eragrostis spectabilis, Kuhnia eupatorioides, Ratibida pinnata, Solidago nemoralis, and Verbena stricta, with Verbascum and Ambrosia invading. Davidson (1959) records the hybrid from Louisa and Muscatine Counties, Iowa, where he found it to be "infrequent" in dry sandy soil.

The Herb. Zuccarini s.n. [Hort. bot. Monac.] collection, cited below, is a mixture with V. stricta Vent.

Additional citations: WISCONSIN: Rock Co.: Tens 1431 (Ts, Ts,

ts). MISSOURI: Reynolds Co.: Mesbold 25420 (Mu). CULTIVATED: Germany: Herb. Zuccarini s.n. [Hort. bot. Monac.] (Mu—375, Mu—376).

VERBENA MONACENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 28: 356, 394, & 451 (1974), 30: 133 (1975), and 34: 270. 1976; López-Palacios, *Revist. Fac. Farm. Univ. Los Andes* 17: 50. 1976; Moldenke, *Phytologia* 36: 40. 1977.

López-Palacios refers to this plant as an "hierba rastrera de unos 30 cms. Flores rosadas" and found it being cultivated at 1650 meters altitude, flowering in August.

Additional citations: CULTIVATED: Colombia: López-Palacios 3618 (Ld, N), 3862 (Tu); López-Palacios & Idrobo 3833 (Ac).

VERBENA MONTEVIDENSIS Spreng.

Additional & amended bibliography: Buek, *Gen. Spec. Syn. Candoll.* 3: 495. 1858; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.*, imp. 1, 717 (1969) and imp. 2, 717. 1974; Moldenke, *Phytologia* 30: 155 (1975), 31: 377 (1975), and 36: 137. 1977.

The corollas on Ferreira 98, Hatschbach 35653, and Kummrow 764 are said to have been "lilac" in color when fresh, on Schinini & Carnevali 10471 they were "purple", and on Fiebrig 4635, Herb. Brad. 22518, Pabst 6146, and E. Pereira 6319 they were "violet".

Ferreira found the plant growing in "orla de brejo". Others have encountered it on high or marshy campos, in rough grassland, along roadsides, on headlands of ricefields and sugarcane fields, in bottomland soil, and in "brejo" (sedge meadows). Muhammad refers to it as "an erect perennial herb, infrequent in open fields maintained by fire", while Urbatsch found it "in roadside and railway right-of-way, aquatic marsh, and dryland habitats".

The corollas on Schinini & Cristóbal 9707 were "violet" in color when fresh, those on Quarín, Schinini, & González 2460 were "purple", those on Krapovickas, Cristóbal, & Schinini 26513 were "white-lilac", and those on Pedersen 9816 were "white".

Lindeman and his associates encountered this plant on a "campo estilo pomar com árvores baixas de espinilo Acacia caven" and say on the label of their no. 8468 "corola 5RP8/4, calice em botão 5RP5/4". The vernacular name, "quina", is reported by Kummrow. Pedersen found the plant in flower and fruit in April.

Additional citations: LOUISIANA: Calcasieu Par.: Thibodeaux 260 (Lv). Cameron Par.: Thibodeaux 236 (Lv). East Baton Rouge Par.: C. A. Brown 18767 (Lv). Jefferson Davis Par.: Thibodeaux 417 (Lv). Lafayette Par.: Thibodeaux 297 (Lv), 321 (Lv). Saint Landry Par.: Thibodeaux 428 (Lv). Tangipahoa Par.: Muhammad 259 (Lv); Urbatsch 1938 (Lv). Vermilion Par.: Thibodeaux 284 (Lv). BRAZIL: Paraná: Dusén 10856 (Mu); L. F. Ferreira 98 (Ld); Hatschbach 35653 (Ld); Kummrow 764 (Tu). Rio Grande do Sul: Lindeman, Irgang, & Valls ICN.8468 (Ut—320457). Santa Catarina: Pabst 6146

[E. Pereira 6319; Herb. Brad. 22518] (Mu). PARAGUAY: Fiebrig 4635 (Mu—4144). URUGUAY: Herter 269 [Herb. Herter 81713] (Mu). ARGENTINA: Corrientes: Krapovickas, Cristóbal, & Schinini 26513 (Ld); Pedersen 9816 (N); Quarín, Schinini, & González 2460 (Ld); Schinini & al. 11864 (Ld); Schinini & Carnevali 10471 (Ld); Schinini & Cristóbal 9707 (Ld). Misiones: Montes 14719 (N), 27576 (N).

VERBENA MONTICOLA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.26: 6. 1975; Moldenke, Phytologia 30: 155 (1975) and 31: 384. 1975.

VERBENA MULTICAULIS Raf.

This taxon is probably the same as V. simplex var. eggerti Moldenke. All previously published notes in this series under this heading should be transferred to that variety.

VERBENA NANA Moldenke

Additional bibliography: Moldenke, Phytologia 30: 155. 1975.

The corollas on Fiebrig 4371 are said to have been "violet-rose" when fresh.

Additional citations: PARAGUAY: Fiebrig 4371 (Mu).

VERBENA NEOMEXICANA (A. Gray) Small

Additional synonymy: Verbena neomexicana var. neomexicana [A. Gray] apud Thomas, Tex. Pl. Ecol. Summ. 78. 1969.

Additional & amended bibliography: G. W. Thomas, Tex. Pl. Ecol. Summ. 78. 1969; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717 (1969) and imp. 2, 717. 1974; E. H. Jordan, Checklist Organ Pipe Cact. Natl. Mon. 7. 1975; Moldenke, Phytologia 30: 138, 155-156, & 180 (1975), 31: 378 (1975), 34: 252 & 279 (1976), and 36: 124 & 158. 1977.

Sample refers to this plant as "rare, in small clumps in dry stream bed". Mrs. Jordan (1975) calls it the "New Mexican vervain" and Thomas (1969) names it the "New Mexico verbena". Urbatsch and his associates aver that it is "uncommon in sandy soil" in Baja California.

Material of this species has been misidentified and distributed in some herbaria as V. gracilis Desf. or V. plicata Greene. On the other hand, the Spellenberg & Spellenberg 3984, distributed as typical V. neomexicana, seems better placed as var. hirtella Perry, while Reeves R.1131 and Wentworth 1061 are var. xylopoda Perry, C. A. Brown 7409 and Montz 2485 are xV. alleni Moldenke, Taylor & Taylor 6230 is V. menthaefolia Benth., Hess & Stickney 3406 and Higgins 9228 are V. perennis Wooton, S. Walker 76H37 is V. pinetorum Moldenke, and Meebold 26696 is V. racemosa Eggert.

Additional citations: TEXAS: Brewster Co.: Sample 357 (W—2732729). ARIZONA: Pima Co.: J. A. Churchill s.n. [7 April 1972] (Ln—235702). Santa Cruz Co.: Reeves R.1198 (N). MEXICO: Baja

California: Urbatsch, Clark, & Betkouski 1136 (Ld). Coahuila: Barkley, Webster, & Rowell 7189 (Ln—189725).

VERBENA NEOMEXICANA var. HIRTELLA Perry

Additional bibliography: G. W. Thomas, Tex. Pl. Ecolog. Summ. 78. 1969; Moldenke, Phytologia 30: 138 & 156 (1975) and 34: 252. 1976.

Arnold found this plant growing on "steep gravelly hills and creek beds" in Coahuila. In Chihuahua the Spellenberg's encountered the plant "on grassy knolls with mostly ocotillo, creosotebush, Yucca torreyi, sotol, and Hedyotis rubra". In Baja California Moran found it "occasional in disturbed roadside soil" and "occasional on sandy flats", at altitudes of 575—1600 meters. Correll & Rollins encountered it "on gravel knolls along roadsides" in Texas.

The corollas are said to have been "deep-blue" on Moran 21749, "blue" on Correll & Rollins 23652 and Moran 20727, "blue-violet" on Moran 20748 and Spellenberg & Spellenberg 3984, and "lavender" on Moran 16893; they were also "blue" on Henrickson 5944.

Other recent collectors have found V. neomexicana var. hirtella growing in "calcareous gravel in chaparral on very steep slopes of limestone sierra", "in calcareous gravelly soil in matorral desértico microfilo on limestone slopes and limestone-conglomerate fan", "in rocky calcareous soil in crasirosulifolio espinosos izotal on steep slopes of metamorphosed shaly limestone", "in dark, sandy, grussy, gravelly loam on gentle slopes of extrusive igneous rock", "in sandy alluvium in matorral desértico inerme on gravel fans", in "calcareous gravelly soil in matorral con espinas laterales in canyons through limestone", "on rocky northeast-facing slopes", in "rocky soil of matorral on steep slopes of igneous rocks with chaparral and encinares (oak woods) higher up", in "rocky reddish clay soil of deserts", and in "limestone outcroppings in open Chihuahuan Desert", in association with Yucca carnerosana, Agave parrasana, A. lecheguilla, Condalia warnockii, Berberis trifoliolata, Mammillaria meiacantha, Opuntia rufida, O. lindheimeri, Acacia rigidula, Viguiera stenoloba, Sagaretia wrightii, Dasyliiron, Quercus, Lindleya, Krameria, Mimosa, Muhlenbergia, Pinus, Larrea, Jatropha, Parthenium, Leucophyllum, Ptelea, Garrya, Juglans, Flourensia, Buddleia, Fouquieria, Nama, grasses, and numerous animals. Henrickson found it "infrequent along highways".

Additional citations: TEXAS: Presidio Co.: Correll & Rollins 23652 (N). MEXICO: Baja California: R. V. Moran 16893 (Sd—76990), 20727 (Sd—88938), 20748 (Sd—88937), 21749 (Sd—91271). Chihuahua: A. A. Heller s.n. [April 6, 1897] (Ln—93653); Henrickson 7617 (Ld); Johnston, Wendt, & Chiang C. 10773b (Ld); Spellenberg & Spellenberg 3984 (N); Wilson, Wilson, Johnston, & Johnston 8510 (Ld). Coahuila: E. T. Arnold 32 (Te—68564); Henrickson 5944 (Ld), 6132 (Ld); Johnston, Wendt, & Chiang C. 10284d (Ld), 10500c (Ld), 11687

(Ld). Nuevo León: Johnston, Wendt, & Chiang C. 10235b (Ld). Zacatecas: Johnston, Wendt, & Chiang C. 10489 (Ld).

VERBENA NEOMEXICANA var. XYLOPODA Perry

Additional bibliography: G. W. Thomas, Tex. Pl. Ecolog. Summ. 78. 1969; Moldenke, Phytologia 30: 156 & 180. 1975.

Recent collectors have encountered this variety on north-facing slopes with rock outcrops, calcareous stones and soils with scattered oaks, on rocky outcrops with Fouquieria, and in Cercocarpus breviflorus scrub on limestone bedrock.

Other collectors have found it growing in rocky limestone soil, in "sandy, grussy, gravelly loam in small creek canyons through extensive igneous rock", in "rocky soil in pastizal, badly degraded and in places invaded by shrubs", on "hill of igneous extrusives with partly volcanic ash red of red color", and in "grussy, gravelly, thin soil on rather steep hills of extrusive igneous rocks", growing in association with Parthenium incanum, Lippia graveolens, Jatropha dioica, Acacia neovernicosa, Bouteloua gracilis, Larrea, Quercus, Pinus, and Pseudotsuga.

In Baja California Moran reports this variety "locally common on open upper south slopes", "scarce on ridges", "occasional in granitic soil on rocky hillsides", and "a small colony on dry rocky slope", at altitudes of 1025-1240 meters. The corollas were "blue" on Moran 20983 & 22170, "blue-violet" on Moran 18264, "light-blue, paler in the center" on Moran 17658, and "purple" on Powell, Turner, & Sikes 2479.

The Wentworth collection cited below is a voucher for ecologic studies.

Additional citations: ARIZONA: Cochise Co.: Wentworth 1061 (N). Pinal Co.: Lehto, Hensel, & Pinkava 11033 (W--2736741). Santa Cruz Co.: Reeves R. 1131 (N). MEXICO: Baja California: R. V. Moran 17658 (Sd--75054), 18264 (Sd--77109), 20983 (Sd--83866), 22170 (Sd--91462). Chihuahua: Chiang C., Wendt, & Johnston 8311a (Ld); Johnston, Wendt, & Chiang C. 10524 (Ld); Powell, Turner, & Sikes 2479 (Ld); Wilson, Wilson, Johnston, & Johnston 8483 (Ld). Tamaulipas: Kuiper & Kuiper-Lapr  M. 15 (Ut--328637B).

VERBENA NIGRICANS Rojas

Additional & emended bibliography: Krapovickas, Bol. Soc. Argent. Bot. 11, Supl. 269. 1970; Moldenke, Phytologia 30: 156 (1975) and 31: 388. 1975.

VERBENA NIVEA Moldenke

Additional synonymy: Glandularia nivea Mold. ex Moldenke, Phytologia 34: 274, in syn. 1976.

Additional bibliography: Moldenke, Phytologia 28: 357 (1974) and 34: 274. 1976.

In addition to the months previously reported by me, this plant has been collected in fruit in February.

The Legname & Vervoorst 101, distributed as V. nivea, actually is V. microphylla H.B.K.

VERBENA OCCULTA Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 376—377 (1972) and 34: 258. 1976; Soukup, *Biota* 11: 19. 1976; Moldenke, *Phytologia* 36: 148. 1977.

Material of this species has been misidentified and distributed in some herbaria as V. calcicola Walp. and V. clavata Ruiz & Pav.

Additional citations: PERU: Arequipa: Princess Therese of Bavaria 281 (Mu).

VERBENA OCCULTA f. ALBA Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 377. 1972; Soukup, *Biota* 11: 19. 1976.

VERBENA OCCULTA f. AURANTIACA Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 377. 1972; Soukup, *Biota* 11: 19. 1976.

VERBENA OFFICINALIS L.

Additional synonymy: Verbena vulgaris folio variegato Breyn., *Prodr. Fasc. Rar. Pl.*, ed. 2, 2: 104. 1739.

Additional & emended bibliography: *Apul. Barb.*, *Herb.*, ed. 1. 1480—1483; Anon., *Dialogue des Créatures*, 30th dial. 1482; *Apul. Barb.*, *Herb.*, ed. 2. 1528; Anon., *Bastiment des Receptes fol.* 59 vert. 1544; H. Bock [Tragus], *Stirp. Max. Germ.* 102. 1552; Dill. in Ray, *Synop. Meth. Stirp. Brit.*, ed. 3, 236. 1724; L., *Hort. Cliff.*, imp. 1, 11. 1737; Breyn., *Prodr. Fasc. Rar. Pl.*, ed. 2, 2: 104. 1739; Strand in L., *Amoen. Acad.* 69: 449. 1756; Chomel, *Abrég. Hist. Pl. Usuel.*, ed. 6, 2 (2): 85—87 & 251. 1761; Ginanni, *Istor. Civ. Nat. Pinet. Ravenn.* 177. 1774; Chomel, *Abrég. Hist. Pl. Usuel.*, ed. 6 nov., 313 & 637. 1782; F. Hernandez, *Hist. Pl. Nuev. Españ.*, ed. 1, 1: 139 & 439 (1790) and ed. 1, 3: 3 & 486. 1790; R. A. Salisb., *Prodr.* 71. 1796; Chomel, *Abrég. Hist. Pl. Usuel.*, ed. 7, 1: 495 (1803) and ed. 7, 2: 488. 1803; Stokes, *Bot. Mat. Med.* 40—41. 1812; A. Rich., *Bot. Méd.* 1: 242—243. 1823; Dierbach, *Arzneimit. Hippok.* 85 & 270. 1824; A. Rich. [transl. G. Kunze], *Med. Bot.* 1: 381 (1824) and 2: 1302. 1826; G. Don in Loud., *Hort. Brit.*, ed. 1, 247 (1830) and ed. 2, 247. 1832; Loud., *Hort. Brit.*, ed. 2, 552. 1832; A. Dietr., *Handb. Pharmaceut. Bot.* 114 & 412. 1837; D. Dietr., *Taschenb. Arzneigew. Deutschl.* 58 & 262. 1838; G. Don in Loud., *Hort. Brit.*, ed. 3, 247. 1839; Spach, *Hist. Nat. Veg. Phan.* 9: 237. 1840; Webb in Hook., *Niger Fl.* 161. 1849; Anon., *Chroniqueur du Périgord* 120. 1853; F. Lenormant, *Bull. Sic. Bot. France* 2: 315—320. 1855; Schnitzlein, *Iconogr. Fam. Nat.* 2: 137 *Verbenac.* [2] & 137, fig. 4—22 & 30. 1856; Buek, *Gen. Spec. Syn. Candoll.* 3: 495 & 496. 1858; Symphor Vaudoré, *Lettr. Vieux Laboureur* 88. 1867; J. Cousin, *Secr. Mag.* 1868: 7, 37, & 45. 1868; Chenaux, *Le Diable & Ses*

Cornes 53 & 54. 1876; Anon., Rev. du Tarn 1877: 39. 1877; Franch., Nouv. Arch. Mus. Hist. Nat. Paris, ser. 2, 6: 112 [Pl. David. 1: 232]. 1883; Strobl, Oesterr. Bot. Zeitschr. 33: 406. 1883; Kuntze, Rev. Gen. Pl. 2: 510. 1891; J. Camus, Récept. Franç. in Bull. Soc. Syndic. Pharmac. Côte-d'Or. 10. 1892; J. Feller, Bull. Folklore 2: 105--109. 1893; Nairne, Flow. Pl. West. India 249. 1894; Van Tieghem, Élémt. Bot., ed. 3, 2: 373. 1898; Bidault, Superst. Méd. Morvan 36. 1899; Diels, Fl. Cent.-China 547. 1902; Anon., Rev. Tradit. Populaires 1904: 162 (1904) and 1905: 160 & 296. 1905; Druce & Vines, Dill. Herb. 78. 1907; Rolland, Fl. Populaire 8: 38--43. 1910; Gilg in Engl., Syllab. Pflanzenfam., ed. 7, 314, fig. 413C. 1912; Loes., Verh. Bot. Ver. Brand. 53: 74. 1912; Gilg in Engl., Syllab. Pflanzenfam., ed. 8, 318, fig. 413C (1919) and ed. 9 & 10, 339, fig. 418C. 1924; Robledo, Bot. Med. 267. 1924; Krause in Just, Bot. Jahresber. 44: 1172. 1926; Fedde in Just, Bot. Jahresber. 44: 1534. 1927; Freise, Bol. Agric. São Paulo 34: 480 & 494. 1933; Gunther, Herb. Apul. Barb. [16v], [35v], 106, 128, 129, & 133. 1935; E. D. Merr., Trans. Am. Phil. Soc., ser. 2, 24 (2): [Comm. Lour.] 331 & 444. 1935; Diels in Engl., Syllab. Pflanzenfam., ed. 11, 339, fig. 432C. 1936; F. Hernandez, Hist. Pl. Nuev. Españ., ed. 2, 653 & 674. 1943; Roi, Atl. Pl. Méd. Chin. [Mus. Heude Bot. Chin. 8:] 96. 1946; Hatta, Kubo, & Watanabe, List Med. Pl. 14. 1952; Sonohara, Tawada, & Amano [ed. E. H. Walker], Fl. Okin. 132. 1952; Pételot, Arch. Recherch. Agron. & Past. Viet. 18: [253]. 1953; Pételot, Pl. Méd. Camb. Laos & Viet. 2: 243 (1954) and 4: 21, 39, 70, 170, 184, 193, 208, & 300. 1954; L., Hort. Cliff., imp. 2, 11. 1968; J. Hutchinson, Evol. & Phylog. Flow. Pl. Dicot. 470, fig. 444. 1969; Rimpler, Lloydia 33: 491. 1970; Saxena, Bull. Bot. Surv. India 12: 56. 1970; Scully, Treas. Am. Ind. Herbs 283. 1970; Anon., Bioresearch Ind. 7: 1061. 1971; Kachroo, Singh, & Malik, Bull. Bot. Surv. India 13: 52. 1971; Kaul, Bull. Bot. Surv. India 13: 240. 1971; Gilmour, Thom. Johnson 31, 50, 78, 106, 107, & 122. 1972; Healy, Gard. Guide Pl. Names 37 & 225. 1972; Frohne & Jensen, System. Pflanzenr. 203, 261, & 305. 1973; Hilbig, Wiss. Zeitschr. Mart. Luth. Univ. Halle 22: 56 & 102. 1973; Law, Concise Herb. Encycl. 85 & 263. 1973; El-Gazzar, Egypt. Journ. Bot. 17: 75 & 78. 1974; Ellenberg, Script. Geobot. 9: 80. 1974; Farnsworth, Pharmacog. Titles 9 (4): x. 1974; R. D. Gibbs, Chemotax. Flow. Pl. 3: 1752--1755 (1974) and 4: 2295. 1974; León & Alain, Fl. Cuba, imp. 2, 2: 281. 1974; Loewenfeld & Back, Complete Book Herbs & Spices 261--264. 1974; A. & D. Löve, Cytotax. Atl. Slov. Fl. 601 & 1241. 1974; Portères, Journ. Agric. Trop. & Bot. Appl. 21: 6. 1974; Stanley & Linskens, Pollen 47, 95, & 306. 1974; Sunding, Garcia de Ort. Bot. 2: 20. 1974; Täckholm, Stud. Fl. Egypt, ed. 2, 454. 1974; Whitney in Foley, Herbs Use & Delight [207]. 1974; R. & A. Fitter, Wild Fls. Brit. & N. Eu. 192, 193, & 336. 1975; Kooiman, Act. Bot. Neerl. 24: 464. 1975; López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 88, 90, & 93. 1975; Weberling & Schwantes, Pflanzen syst., ed. 2 [Ulmer, Uni-Taschenb. 62:] 144. 1975; Moldenke, Phytologia 30: 156--161 (1975), 31: 410 & 412 (1975), and 34: 249, 254, 260--262, 266, & 279. 1976; Anon., Biol. Abstr. 61: AC1.732. 1976; Gal-

iano & Cabezudo, Lagascalia 6: 150. 1976; Keys, Chinese Herbs 283—284 & 387. 1976; Lakela, Long, Fleming, & Genelle, Fl. Tampa Bay, ed. 3 [Bot. Lab. Univ. S. Fla. Contrib. 73:] 116 & 182. 1976; Lousley, Fl. Surrey 282, map 288. 1976; Soukup, Biota 11: 19. 1976; E. H. Walker, Fl. Okin. & South. Ryuk. 883—884. 1976; Moldenke, Phytologia 36: 40, 126, 138, & 152. 1977; A. L. Moldenke, Phytologia 36: 87. 1977.

Additional illustrations: H. Bock [Tragus], Stirp. Max. Germ. 102. 1552; Schnitzlein, Iconogr. Fam. Nat. 2: 137 Verbenac. fig. 4-22 [partly in color] & 30. 1856; Van Tieghem, Élém. Bot., ed. 3, 2: 373. 1898; Gilg in Engl., Syllab. Pflanzenfam., ed. 7, 314, fig. 413 C (1912), ed. 8, 318, fig. 413 C (1919), and ed. 9 & 10, 339, fig. 418 C. 1924; Gunther, Herb. Apul. Barb. [16v]. 1935; Diels in Engl., Syllab. Pflanzenfam., ed. 11, 339, fig. 432 C. 1936; Roi, Atl. Pl. Méd. Chin. [Mus. Heude Not. Bot. Chin. 8:] 96. 1946; J. Hutchinson, Evol. & Phylog. Flow. Pl. Dicot. 470, fig. 414. 1969; Loewenfeld & Back, Complete Book Herbs & Spices [262]. 1974; R. & A. Fitter, Wild Fls. Brit. & N. Eu. 193, fig. 7 (in color). 1975; Keys, Chinese Herbs 283. 1976.

Recent collectors have encountered this plant "along water channels", in irrigated wheat fields, and "on granite substrate".

Lakela and her associates (1976) aver that in the Tampa Bay [Florida] area V. officinalis inhabits "trails, wooded lots, [and] burns", flowering from spring to fall, but it is most probable that the reference here is to V. halei Small.

Mrs. Clemens refers to V. officinalis as a "common weed" in Queensland. Hendricks 590, cited below, was "purchased in market place" in Durango, Mexico, and is questionably referred here — it may, instead, actually represent the top portion of a native Mexican species.

Hutchinson (1969) regards the Verbenaceae (of which Verbena officinalis is the type species of the type genus) as the culmination of the "fundamentally woody phylum, Lignosae" and therefore "at the end of the author's system" of classification of flowering plants (dicotyledons).

Sunding (1974) records V. officinalis from Santiago Island in the Cape Verde Islands, citing Sunding 2849, while Webb (1849) cites Hooker f. 120 from Santo Jacobi island. Saxena (1970) reports it as "Rare in open places" in India, citing Indorkar 11146. Kaul (1971) refers to it as an "Annual herb. Flowers pinkish white" and found it to be "rare" in Kashmir, India, flowering and fruiting there from June to August, citing Kaul 4624S. Strand (1756) records it from Palestine. Sonohara and his associates (1952) refer to it as "A perennial herb, common on plains; used for drugs" in Okinawa and records the common name, "kumatsuzura". Walker (1976) cites Hatusima 24199 from Yonaguni island. Lousley (1976) reports that in Surrey (England) it is "locally frequent" in "Chalk downs, quarries, waste places and roadsides, in dry places on chalk or gravel soils. Most common on the chalk."

The illustration given by Loewenfeld & Back (1974), purporting to depict V. officinalis, is horribly poor and most unrepresentative of that taxon. The illustration given by Schnitzlein (1856), purporting to be of V. supina L., seems to represent V. officinalis instead.

Friese (1933) comments that "A familia das Verbenaceas conta no Estado do Espirito Santo [Brazil] uma representante não descrita ainda, pertencente ao genero Verbena, bem affim á especie V. officinalis L., em fôrma de subarbusto escandente, parcamente armado de espinhos; folhas oppostas e denteadas; inflorescencia em fôrma de espiga com flôres amarellas ou brancas; fruto drupaceo". This he follows with a description of the medicinal uses for the leaves, but it is most uncertain to what plant he is here referring: possibly a Lantana, but most certainly not Verbena officinalis!

Petélot (1953) affirms that V. officinalis "Répandue dans toutes les régions tempérées et même tropicales" [in Indochina]. "C'est une plante amère légèrement tonique. Au Centre-Vietnam, la plante est considérée comme amère et aromatique et Loureiro... signale qu'elle est employée en décoction contre l'hydropisie et en cataplasmes sur les tumeurs du scrotum. D'après le R. P. Robert, elle passe pour régulariser les menstrues et pour guérir la 'boule hystérique'. Pour cela, on en prépare une purée que l'on fait cuire et qui se prend avec de l'alcool de riz." The Chinese name for the plant there is "ma pien ts'ao", the Vietnamese name is "cò roi ngĩa", and in Mexico the Mayan name is "chichi-antic".

Linnaeus (1737) says of this species "Crescit juxta areas & vias inque locis ruderatis per Belgium, Angliam, Galliam, &c." Breynia (1739) says of it "VERBENA vulgaris folio variegato; nobis in Horto Honestissimae Sapientissimaeque Matronae, Domine de Flines, collegimus. Verbenae Notae: 1) Flores tubulosi, in extremo vdx galeati & labiati, in caulium nec non ramorum summo, vel etiam in virgulis longis e foliorum sede exeuntibus spicatum ut plurimum dispositi; 2) Calix foliolis constructus; 3) Semina quaterna oblonga."

In addition to the several hundred vernacular names recorded by me in previous installments of this series of notes, Rolland (1910) lists the following: "aelius", "auricula vervicina", "ayân nouthay", "barbântano", "barbénaga", "barbáno", "barbêra", "barlenn", "benerea", "beneria", "berbeana", "bêrbég", "bêrbên", "berbenaca", "bêrbêno", "bêrbiêno", "bêrmây'no", "bêrmêno", "biscopwurtil", "bona herba Veneris", "bonion", "bordêno", "botanicoa", "bouono barbêno", "brébouane", "centrum galli", "cincinalis", "clumbeina", "columbaine", "columbaria", "columbaris", "columbina recta", "columbyne", "créy'jêta", "créy'sêta", "crijêta", "crista gallinacia", "crous", "dametra", "darbêno", "demedria", "demetina", "demetria", "diosatin", "diosatin", "eisebrich", "emagallis", "erba colombina", "erba de san-Gioan", "erba milzea", "erba minsaea", "erbo crousado", "erbo crusado", "erbo dé la mêrbêlho", "erbo dé la rato", "erbo dé lo bêrbêno".

[to be continued]